SOIL SURVEY OF

Rutherford County, Tennessee

United States Department of Agriculture
Soil Conservation Service

In cooperation with
University of Tennessee Agricultural Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1964–72. Soil names and descriptions were approved in 1973. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1972. This survey was made cooperatively by the Soil Conservation Service and the University of Tennessee Agricultural Experiment Station. It is part of the technical assistance furnished to the Rutherford County Soil Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, or recreation.

Locating Soils

All of the soils of Rutherford County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in this publication. This guide lists all the soils of the county in alphabetic order by map symbol. It shows the capability unit and the woodland group in which each soil has been placed. It also shows the page where each soil is described and the page where each capability unit is described.

Individual colored maps that show the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those that have a moderate limitation can be colored yellow, and those that have a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions, from the descriptions of the capability units, and from the sections "Use of the Soils for Crops and Pasture," "Use of the Soils for Woodland," and "Management of the Soils for Wildlife Habitat."

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of Rutherford County are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife habitat in the section "Management of the Soils for Wildlife Habitat."

Community planners and others can read about soil properties that affect the choice of homesites and the like in the section "Use of the Soils in Engineering."

Engineers and builders can find, under "Use of the Soils in Engineering," tables that contain estimates of soil properties and information about soil features that affect engineering practices and structures.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text, depending on their particular interest.

Newcomers in Rutherford County may be especially interested in the section "General Soil Map," where broad patterns of soils are described, and in the section "General Nature of the County."

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SOIL SURVEY OF RUTHERFORD COUNTY, TENNESSEE

BY J. C. TRUE, W. C. JACKSON, E. P. DAVIS, C. F. WHARTON, AND O. G. SPROUSE, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE UNIVERSITY OF TENNESSEE AGRICULTURAL EXPERIMENT STATION

RUTHERFORD COUNTY, the central county of Tennessee (fig. 1), has an area of 403,200 acres, or 630 square miles. The geographical center of the State is about 2 miles northeast of the courthouse in Murfreesboro. Murfreesboro, the county seat, is about 34 miles southeast of Nashville.

Rutherford County is also near the center of the physiographic region known as the Central Basin. Although Rutherford County is nearly surrounded by high hills and ridges, it is the most level county in the Central Basin. Elevation ranges from 1,352 feet above sea level at the highest point in the county, in the southeast corner, to 490 feet at the lowest point—the normal water level of the Percy Priest Lake reservoir on Stones River—in the northwest corner. About 50 percent of the county is nearly level to rolling and has an average elevation of about 600 feet.

The highest ridges and hills are capped with remnants of the Highland Rim. These ridges and hills are made up mostly of steep, cherty soils that are suited to pasture and trees but ordinarily not well suited to cultivated crops. The soils on the lower two-thirds of these hills and on most of the other hills that surround the county are rich in phosphorus. The soils in other parts of the county formed in clayey limestone residuum, in old alluvium, or partly in old alluvium and partly in the underlying clayey residuum. Many of the soils are clayey throughout and are slowly permeable. Soils on broad, flat areas range from well drained to poorly drained. Some have a thick, dark-colored surface layer. Small areas of soils that formed in recent alluvium are on the flood plains.

The rocks that underlie the soils of Rutherford County are almost entirely limestone. Hardly a square mile of the county is without outcrops of rock, and most streams run on clean bedrock (fig. 2) and have numerous small falls and shoals. Because the underlying limestone is relatively soluble and climatic conditions favor rapid weathering of the rock, the land surface of most of the county is pitted with numerous sinkholes and depressions.

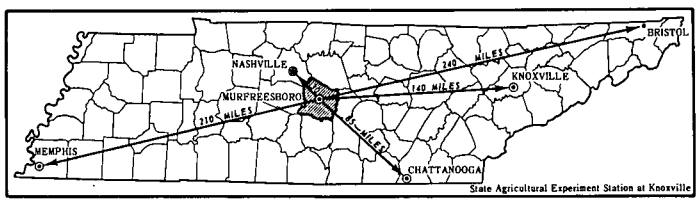

Figure 1.—**Location of Rutherford County in Tennessee.**

General Nature of the County

Rutherford County was authorized by the State legislature on October 25, 1803. It included territory from Williamson and Davidson Counties. It was named in honor of General Griffith Rutherford, a Revolutionary War hero and a member of the North Carolina Assembly. Murfreesboro, named after another Revolutionary War leader, Colonel Hardy Murfree, was incorporated by the Tennessee General Assembly in 1817. The city served as the State capital from 1819 to 1826.

Rutherford County was originally a part of the territory used as hunting grounds by the Cherokee, Chickasaw, Choctaw, and Shawnee Indians. French traders and other white trappers and hunters first came into the area about 1710. The first permanent settlers came to the county in 1783, when a commission from North Carolina surveyed the area. In 1786 North Carolina made many grants in the area of the Stones River to Revolutionary War soldiers.

In 1970 the population of Rutherford County was 59,428. Approximately 65 percent of the population was urban, and 35 percent was rural. Murfreesboro, the county seat and largest city in the county, had a population of 26,360. Three other incorporated towns in the county and their populations are LaVergne, 5,208; Smyrna. 5,698; and Eagleville, 437.

Rutherford County is chiefly an industrial county, although farming furnishes a large amount of the total income. The county's industrial growth has increased from three major manufacturers in 1956 to 30 at the end of 1969. Located mainly in and around Murfreesboro, Smyrna, and LaVergne are factories that manufacture furniture, electric motors, electric heating elements, plastic signs, women's sportswear, cartons and corrugated shipping containers, plastic discs for phonograph records, tungsten carbide metal, infants' and children's hosiery, sewing machine parts, hospital food serving equipment, casters and carts, fertilizers,

Figure 2.—**The channel of Cripple Creek. Most streams in the county run on limestone bedrock.**

truck tires, redcedar products, bakery products, evaporated milk, ice cream, dried milk, butter and cheese, and other dairy products. Also in the county is the regional office of a large insurance company, a Veterans Administration hospital, and Middle Tennessee State University.

Six Federal highways, including one in the national interstate system, and two airports serve Rutherford County. One railroad traverses the county from northwest to southeast, and another line of the same railroad follows the county line west of Eagleville for about 3 miles.

The county is drained almost wholly by the Stones River and its tributaries. Much of the rainwater, however, flows into underground channels through sinkholes and joints in the underlying rock, so there are very few surface streams other than the rivers and large streams. An area of about 60 square miles north and east of Eagleville is drained by the headwaters of the Harpeth River, and an area of about 8 square miles south of Eagleville drains southward to the Duck River. Percy Priest Lake, constructed by the U.S. Army Corps of Engineers on the Stones River, occupies about 5,000 acres of Rutherford County (fig. 3).

According to the U.S. Census of Agriculture, farms in Rutherford County have decreased more than 100 percent in number and increased about 40 percent each in size in the past 25 years. There were 2,064 farms in the county in 1969, and the average farm was 144 acres. About 94 percent of the farms were operated by owners or part owners, but only about 65 percent of the farm operators were classified as full-time farmers.

Most of the farmland in the county is used for pasture, hay, corn, silage, small grain, cotton, soybeans, and tobacco. A large acreage also is forested; redcedar, hickory, and upland oaks are the dominant trees. Cotton, small grain, soybeans, and tobacco are the main cash crops. Tall fescue, orchardgrass, annual lespedeza, white clover, red clover, and alfalfa are the principal hay crops. The hay is used as livestock feed on the farms and also is sold as a cash crop. Improved

Figure 3.—Recreation area on Percy Priest Lake.

pasture is mainly tall fescue, white clover, and orchardgrass. Many farmers, especially dairy farmers, grow supplemental pasture, mostly millet and sudangrass.

Dairying and livestock farming are the most important sources of farm income. The number of beef cattle has been steadily increasing, and the number of dairy cattle, sheep, and poultry has decreased in the past 15 years. The number of hogs has remained fairly constant.

Climate [1]

The climate of Rutherford County, in common with Tennessee and much of the southeastern United States, is characterized by relatively mild winters, warm summers, and generally abundant rainfall. Although the area is not near a large body of water, it is far enough east to be influenced by air masses from the Gulf of Mexico and far enough north to be frequently traversed by cold air masses from northern regions. Consequently, the county experiences large seasonal and even daily variations in temperature and humidity.

Rutherford County is centrally located in the Central Basin, an extensive farming section of Middle Tennessee. It consists of rolling farmland, flat river valleys, and numerous hills and ridges. Most of the county is at an elevation of 600 to 800 feet, but many of the hills and ridges are more than 1,000 feet above sea level. Daily variations in weather occur between different locations in the county, but differences in altitude are not large enough to cause major differences in climate. For this reason, the climatological data shown in table 1 for Murfreesboro, which is in the Stones River Valley at an elevation of 600 feet, may be considered representative of the entire county.

The average annual temperature at Murfreesboro is 60° F, but temperature extremes of 109° and −19° have been reported during the period 1931–70. Temperatures above 100° in summer are rare, however, and extremely cold spells in winter seldom last more than a few days. In the course of an average winter, freezing extends into the ground to a depth of about 4 inches.

Table 2 indicates that the average dates of the last freezing temperature in spring and the first in fall at Murfreesboro are, respectively, April 5 and October 25. This means the average growing season is 203 days. Elsewhere in the State, the average dates of selected freezing temperatures differ from those in the immediate area of Murfreesboro by about a week in both the cooler northeast and the warmer southwest.

The average annual rainfall is 49 inches, sufficient for farming and related activities. The total annual rainfall for the 1931–70 period at Murfreesboro has ranged from 34.91 inches in 1941 to 62.98 inches in 1951. Months of greatest precipitation are normally in winter and spring. During summer local showers and thunderstorms are frequent, and thunderstorms occur on an average of about 10 days each month. Thunderstorms occur on about 55 days in an average year. The lightest precipitation is in fall and is brought about by slow-moving, rain-suppressing high-pressure areas. During the warm season an average of one or more dry spells occurs each year, and a more serious drought can be expected about every 6 or 7 years. On the other hand, wet periods and periods of excessive rainfall sometimes occur. A rainfall of 4.5 inches in 12 hours can be expected about once every 7 or 8 years; 3.0 inches in 2 hours, once every 25 years; and 1.5 inches in 1 hour, about once every 2 years.

Severe storms have been relatively infrequent in Rutherford County. Only ten tornadoes were reported in the county during the period 1916–70. The area is too far inland to experience much damage from tropical storms. Hailstorms occur at a given locality about two times a year, mostly in spring. Heavy snowstorms are infrequent, and snow in winter seldom remains on the ground more than a few days.

Relative humidity throughout the day usually varies inversely with temperature and is. therefore. highest early in the morning and lowest late in the afternoon. An annual variation of relative humidity also occurs: the average daily values are higher in winter and lower in spring.

The prevailing winds are southerly, and the average windspeed is about 6 miles per hour. The wind changes direction frequently; it is from the south only about 15 percent of the time. The average monthly windspeed varies from about 5 miles per hour in August to about 9 miles per hour in March. Windspeeds are 3 miles per hour or less about 27 percent of the time; 4 to 12 miles per hour. 57 percent; 13 to 24 miles per hour, 15 percent; and 25 miles per hour or higher, about 1 percent of the time. Winds are usually lighter early in the morning and stronger early in the afternoon.

[1] By JOHN VAIKSMORAS, Climatologist for Tennessee, National Weather Service, U.S. Department of Commerce.

TABLE 1.—*Temperature and precipitation*

[Data from Murfreesboro, elevation 600 feet, latitude 35° 50′ N., longitude 86° 23′ W. Period of record, 1931–70]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Days that have snow cover	Average depth of snow on days that have snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than —	More than—		
	°F	°F	°F	°F	*Inches*	*Inches*	*Inches*	*Number*	*Inches*
January	50	30	67	12	5.0	1.7	10.5	3.3	3.1
February	53	32	69	22	5.1	2.0	6.4	2.9	1.4
March	61	39	77	30	5.3	3.3	6.9	1.7	.6
April	72	48	86	39	4.3	2.2	5.4	(1)	(2)
May	81	56	91	49	4.3	1.8	5.8		
June	88	64	98	61	3.4	1.3	4.2		
July	91	68	99	67	4.1	1.7	6.5		
August	90	67	100	65	3.6	1.1	5.5		
September	85	59	98	53	3.3	.9	4.6		
October	75	48	87	39	2.4	.8	4.0	(1)	(2)
November	61	38	77	23	3.8	1.6	5.9	1.0	.5
December	52	32	69	15	4.4	2.0	7.1	2.6	1.4
Year	72	48	[3] 101	[4] 2	49.0	41.5	54.5	12.0	2.0

[1] Less than one-half day.
[2] Trace.
[3] Average annual highest temperature.
[4] Average annual lowest temperature.

TABLE 2.—*Probabilities of last freezing temperatures in spring and first in fall*

[Data from Murfreesboro]

Probability	Dates for given probability and temperature				
	16° F or lower	20° F or lower	24° F or lower	28° F or lower	32° F or lower
Spring:					
1 year in 10 later than	March 13	March 22	March 29	April 14	April 21
2 years in 10 later than	February 28	March 10	March 20	April 4	April 13
5 years in 10 later than	February 13	February 25	March 9	March 25	April 5
Fall:					
1 year in 10 earlier than	November 28	November 15	November 3	October 22	October 10
2 years in 10 earlier than	December 6	November 22	November 10	October 29	October 17
5 years in 10 earlier than	December 17	December 1	November 17	November 5	October 25

Clouds cover less than 60 percent of the sky, on the average, between sunrise and sunset. Average cloud cover varies annually from about 70 percent in January to about 50 percent in October. As a result, sunshine is abundant, especially during the growing season, when it averages slightly more than 63 percent of the possible amount.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Rutherford County, where they are located, and how they can be used. The soil scientists went into the county knowing they would likely find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kind of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers or horizons in a soil. It extends from the surface down into the parent naterial that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey (7).[2]

[2] Italic numbers in parenthese refer to Literature Cited, p 92.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all of the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or geographic feature near the place where a soil of that series was first observed and mapped. Arrington and Cumberland, for example, are the names of two soil series. All soils in the United States that have the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a phase indicates a feature that affects management. For example, Cumberland silt loam, 2 to 5 percent slopes, is one of several phases within the Cumberland series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields. a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series or of different phases within one series. The soil complex is one such kind of mapping unit shown on the soil map of Rutherford County.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils joined by a hyphen. Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes, is an example.

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

Only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory and yield data have been assembled. The mass of detailed information then needs to be organized in a way that is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, community planners, and homeowners.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. Then they adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evaluated reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in the survey area. A soil association is a landscape that has a distinctive pattern of soils in defined proportions. It typically consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in an association can occur in other associations, but in different patterns.

A map that shows soil associations is useful to people who want to have a general idea of the soils in a survey area, who want to compare different parts of that area, or who want to locate large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide for broad planning on a watershed, a wooded tract, or a wildlife area or for broad planning of recreational facilities, community developments, and such engineering works as transportation corridors. It is not a suitable map for detailed planning for management of a farm or field or for selecting the exact location of a road or building or other structure, because the soils within an association ordinarily vary in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The nine soil associations in Rutherford County are described in the pages that follow.

1. Rock Outcrop-Talbott-Barfield Association

Limestone outcrops and well-drained, nearly level to moderately steep soils that have a clayey subsoil; on uplands

This association is characterized by nearly bare rocky places called "glades" and by bouldery limestone outcrops. The patches of soil between the rocks range from a few square feet to a few acres in size (fig. 4). The soils range from moderately deep to shallow and have a clayey subsoil. The landscape is dominantly undulating and rolling. Limestone sinks are common. Slopes are mostly less than 12 percent, but a few protruding knobs and hills have slopes of more than 20 percent.

This association makes up about 45 percent of the county. It is about 40 percent Rock outcrop, 20 percent Talbott soils, and 10 percent Barfield soils. The rest is minor soils.

Rock outcrop is limestone that in most places extends 1 foot to 3 feet above the soil surface. In about one-fourth of the places, however, the outcrops are

Figure 4.—**Typical landscape in the Rock outcrop-Talbott-Barfield association. Talbott and Barfield soils are on the ridgetop and in the foreground. Gladeville soils are between outcrops of rock.**

practically level with the surface and can be driven over with machinery. In a few places the outcrops are widely spaced; in others they occupy as much as 90 percent of the land surface.

Where not severely eroded, Talbott soils typically have a surface layer of brown silt loam and a subsoil of yellowish-red, plastic clay that is moderately slowly permeable. Depth to bedrock is 20 to 40 inches. These soils are in small patches between the rocks in some areas. In others, they are a few acres in size and have only a few outcrops of rock.

The Barfield soils are generally 10 to 20 inches deep to limestone. They typically have a surface layer of very dark brown silty clay loam and a subsoil of very dark grayish-brown and olive-brown, plastic clay that is moderately slowly permeable. These soils have about the same pattern of occurrence between the rocks as do the Talbott soils.

The most extensive of the minor soils are the shallow, flaggy Gladeville soils, which make up nearly 10 percent of the association. They are less than 12 inches deep to flaggy limestone. There are a few scattered areas of the well-drained, deep Bradyville, Harpeth, and Lomond soils and the flaggy, moderately deep Inman soils in the uplands. Small tracts of Capshaw, Tupelo, and Dowellton soils are on upland flats. Arrington, Egam, Eagleville, and Dilton soils are on the few narrow strips of bottom land.

About 40 percent of the association is in heavily cutover woodland consisting mainly of redcedar, hickory, elm, hackberry, and oak trees. Much of the cleared land is idle or is unimproved pasture. After years of cultivation and severe erosion, a large acreage has been abandoned.

The average farm in this association is about 100 acres in size. Farming is limited chiefly by rockiness, and raising beef cattle is the main enterprise. Most pastures are unimproved, and much of the woodland is grazed. Many farmers have some income from the sale of wood products, chiefly redcedar. About 70 percent of the farmers supplement their income by working off the farm 100 days or more a year.

Rockiness and the moderately slow permeability, the high content of clay, the low bearing strength, and the moderate to high shrink-swell potential of the soils present severe engineering hazards for development of roads, industry, and housing on soils of this association. The area is not well suited to residential develop-

Figure 5.—**Typical landscape in the Bradyville-Lomond-Talbott association.**

ment that requires septic tank sewage disposal systems or to roads. It is better suited to recreational uses that require only limited development. Such uses include hunting and fishing, nature and hiking trails, campsites, and picnic areas.

2. Bradyville-Lomond-Talbott Association

Well-drained, nearly level to moderately steep soils that have a reddish clayey or loamy subsoil; on uplands

This association has a dominantly gently rolling landscape but ranges from nearly level to rolling (fig. 5). Shallow depressions are common, and much of the surface water drains into them and seeps down. All of the association is underlain by limestone, and limestone outcrops are around some of the deeper depressions and along the deeper drainageways.

This association makes up about 25 percent of the county. It is about 35 percent Bradyville soils, 10 percent Lomond soils, and 10 percent Talbott soils. The rest is minor soils and small areas of Rock outcrop.

Much of the area has a mantle of loess or old alluvium, or both, deposited over clay that weathered from limestone. Bradyville soils occur where the mantle of loess or old alluvium is about 15 to 30 inches thick over the clay; Lomond soils, where the mantle is 25 to 50 or more inches thick; and Talbott soils, where it is very thin or absent. All three soils are well drained.

The Bradyville soils have a surface layer of dark-brown or dark reddish-brown silt loam and a subsoil of reddish clay. Bedrock is at a depth of 40 to 60 inches. The Lomond soils have a surface layer of dark reddish-brown silt loam and a subsoil of reddish loam. Bedrock is at a depth of more than 5 feet. The Talbott soils have a surface layer of brown silt loam and a subsoil of reddish clay. Bedrock is at a depth of 20 to 40 inches. A few outcrops of limestone occur in some areas of Bradyville and Talbott soils.

Among the minor soils are Cumberland and Barfield soils in small areas on gently rolling uplands; Dowellton, Tupelo, Capshaw, Nesbitt, Woodmont, and Almaville soils on upland flats and terraces; and Harpeth, Arrington, Egam, Roellen, Eagleville, and Dilton soils along large streams and small drainageways and in depressions.

About 75 percent of the association has been cleared of the original hardwood forest. Most rocky areas and wet soils are in heavily cutover woodland consisting of redcedar, hickory, elm, hackberry, and oak trees. About 30 percent of the cleared land is idle or is unimproved pasture.

The average farm in this association is about 320

Figure 6.—**Typical landscape in the Lomond-Cumberland association. Cumberland soils are commonly at higher elevations.**

acres in size, but some farms exceed 1,000 acres. The main farm enterprises are raising beef cattle and dairying. Corn, small grain, silage, and grain sorghum are the main crops. Although the total acreage is small, cotton is the principal cash crop of a few farms in this area. About 50 percent of the pasture is improved. Annual lespedeza and mixtures of grasses and white clover or annual lespedza are the principal hay crops. About 30 percent of the farmers supplement their income by working off the farm 100 days or more a year.

The high content of clay, the low bearing strength of the soils, and in some places, rockiness and the moderately slow permeability present severe engineering hazards for development of roads, industry, and housing on soils of this association. Most trees, shrubs, grasses, and legumes common to this area make fair to good growth on most of the soils of this association.

3. Lomond-Cumberland Association

Well-drained, nearly level to sloping soils that have a reddish loamy or clayey subsoil; on uplands

This association consists of gently rolling uplands. Broad, smooth, nearly level areas are characterized by saucer-shaped, shallow depressions; limestone sinks; and short, winding drainageways that terminate in the depressions (fig. 6). Slopes are mostly 2 to 5 percent, but they range from 0 to 12 percent. The association is underlain by limestone, and a few limestone outcrops are around the sinks and along the deeper drainageways.

This association makes up about 12 percent of the county. It is about 30 percent Lomond soils and 30 percent Cumberland soils. The rest is minor soils.

In most of the area, a 3- to 6-foot mantle of old alluvium or loess, or both, was deposited over the yellowish or reddish clay that weathered from limestone. On the more nearly level areas, there appears to be a layer of loess approximately 2 feet thick underlain by a layer of old alluvium a few feet thick that, in turn, is underlain by clay that weathered from limestone. The well-drained Lomond soils formed in this area. These soils have a subsoil of dominantly yellowish-red loam.

On the higher, gently rolling areas, Cumberland soils formed in a sequence of a few feet of old alluvium underlain by clay that weathered from limestone. These soils have a subsoil of dark-red or dark reddish-brown clay. Lomond and Cumberland soils are more than 5 feet deep to limestone rock.

Among the minor soils are the deep, loamy, well-drained Harpeth soils in numerous small areas on upland flats and in the broader depressions. The well-drained, loamy Arrington soils are in small areas along drainageways and in the bottoms of depressions. Small areas of the well-drained Bradyville and Talbott soils are scattered through the uplands; and small areas of

wet, clayey soils, such as Roellen and Eagleville soils, are on the bottom lands and a few upland flats.

Most of the association has been cleared of the original hardwood forest. About 15 percent of the acreage, consisting mainly of rocky and wet areas, is a thin stand of redcedar, hickory, elm, hackberry, and oak trees.

The average farm in this association is about 300 acres in size. Some of the largest farms in the county, however, are on this association. Raising beef cattle, dairying, and growing row crops are the main farm enterprises. Corn, small grain, grain sorghum, and silage are the principal crops, but cotton is the main cash crop for a few farms. About 75 percent of the pasture is improved, and some alfalfa is grown for hay. About 25 percent of the farmers supplement their income by working off the farm 100 days or more a year.

The high content of clay in the Cumberland soils and the wetness, low bearing strength, high content of clay, and moderate shrink-swell potential of many of the minor soils present the greatest engineering hazards on soils of this association, mainly for development of roads. The major soils and many of the minor soils are well suited to and produce good growth of all trees, shrubs, crops, grasses, and legumes common to this area.

4. Hillwood-Talbott Association

Well-drained, gently sloping to moderately steep soils that have a reddish gravelly and very gravelly, loamy and clayey subsoil or a reddish clayey subsoil; on uplands

This association consists of high, gravelly hills and knobs along the East Fork Stones River. Reddish, gravelly soils that formed in old, gravelly river deposits are on the tops and upper parts of the hillsides. Soils that have a reddish-colored, plastic clay subsoil and that formed in material weathered from limestone are on the lower parts of the hillsides. Slopes are mostly 10 to 20 percent, but they range from 2 to 20 percent.

This association makes up only 1 percent of the county. It is about 50 percent Hillwood soils and 25 percent Talbott soils. The rest is minor soils.

The Hillwood soils are well-drained, moderately rapidly permeable, gravelly soils. The upper 3 to 8 feet of these soils formed in old sediments of yellowish-red or reddish-brown silty clay loam, silty clay, or clay that is 35 to 80 percent water-rounded chert pebbles. Below the gravelly sediments, there is generally 1 foot to 5 feet of plastic clay that extends to limestone bedrock.

The Talbott soils have a thin, silty surface layer and a red or yellowish-red, moderately slowly permeable, clayey subsoil. These soils commonly occupy the lower slopes below the Hillwood soils. They range from 20 to 40 inches deep to limestone bedrock, but about one-fifth of the areas of these soils have outcrops of rock covering 10 to 25 percent of the surface. In many places in this association, the Talbott soils have chert pebbles scattered over the surface and throughout the surface layer.

Minor soils consist mostly of small areas of the well drained Cumberland, Lomond, Bradyville, and Harpeth soils on uplands and small areas of the well drained Arrington soils and the moderately well drained Egam soils on bottom land.

About 80 percent of the association has been cleared of the original hardwood forest and is used mainly for pasture. Most rocky areas and about half of the acreage of Talbott soils is in heavily cutover woodland consisting of redcedar, hickory, hackberry, elm, and oak trees. About one-fifth of the acreage of Hillwood soils is covered with a sparse growth of trees, mainly oak and hickory.

The average farm in this association is about 200 acres in size; however, most of the association consists of parts of larger farms extending from adjacent soil associations. Raising beef cattle and growing grass-legume mixtures for hay are the main farm enterprises. Most of the pastures are improved. About 25 percent of the farmers supplement their income by working off the farm 100 days or more a year.

Except for steepness, the Hillwood soils have many favorable engineering properties. The content of gravel in these soils is high enough in most places to make them a fair to good source of road building material. The high content of clay, the moderate shrink-swell potential, the low bearing strength, and the moderately slow permeability of the Talbott soils present severe hazards for most engineering uses. Most trees, shrubs, grasses, and legumes common to this area make good growth on most of the soils of this association.

5. Rock Outcrop-Mimosa-Inman Association

Limestone outcrops and well-drained, sloping to steep phosphatic soils that have a clayey subsoil; on uplands

This association consists of dominantly steep, high, rounded hills and knobs (fig. 7). The hills are dissected by many deep drainageways. Most of the association adjoins the higher cherty hills along the eastern and southern boundaries of the county, but it includes several areas of isolated hills and knobs in the southwestern part of the county. Slopes range from 2 to 40 percent, but they are dominantly 20 to 40 percent.

This association makes up about 2 percent of the county. It is about 50 percent outcrops of limestone rock, 25 percent Mimosa soils, and 10 percent Inman soils. The rest is minor soils.

Rock outcrop is mainly phosphatic limestone, but near the tops of some of the highest hills and knobs, there are a few outcrops of shale and cherty limestone. The rocks generally extend 1 foot to 3 feet above the surface. Outcrops are widely spaced in some places—a few acres of soil have no outcrops—and they cover as much as 90 percent of the surface in others. The outcrops are mostly in areas of Mimosa soils.

The Mimosa soils, which are 40 to 60 inches deep to phosphatic limestone, typically have a surface layer of brown cherty silt loam and a subsoil of yellowish-brown, firm clay that has moderately slow permea-

Figure 7.—**Landscape in the Rock outcrop-Mimosa-Inman association. Inman soils are in the foreground, and Rock outcrop and Mimosa soils are on the higher, wooded slopes.**

bility. These soils are in very small patches between the rocks in some areas. In others, they are a few acres in size and have only a few outcrops of rock.

The Inman soils are 20 to 40 inches deep to rock. They have a surface layer of brown or dark grayish-brown flaggy silt loam and a subsoil of yellowish-brown or light olive-brown, flaggy clay that is moderately slowly permeable. These soils are 15 to 35 percent, by volume, flat slabs of limestone.

Minor soils are mainly Hampshire and Ashwood soils on uplands and Armour, Arrington, Cannon, Capshaw, Eagleville, Egam, and Lynnville soils in narrow strips along the valley floor.

About 80 percent of the association is in heavily cutover woodland consisting mainly of oak, hickory, yellow-poplar, and redcedar. Erosion has been severe on this association, and a large percentage of the cleared land is idle or in low-quality unimproved pasture. On many of the idle fields, a young growth of black locust trees has volunteered.

The average farm in this association is about 350 acres in size. Farming is limited chiefly by rockiness, and raising beef cattle is the main enterprise. Most pastures are unimproved, and much of the woodland is grazed. Some wood products are harvested and sold in this area, chiefly redcedar and black locust for fenceposts. About 50 percent of the farmers supplement their income by working off the farm 100 days or more a year.

Rockiness, steepness, the high content of clay, the low bearing strength, and the moderately slow permeability of the soils present severe engineering hazards for development of roads, industry, and housing on soils of this association. Most trees, shrubs, grasses, and legumes common to this area make fair to good growth on most of the soils of this association.

6. Dellrose-Mimosa-Bodine Association

Well-drained and excessively drained, sloping to steep cherty soils that have a loamy or clayey subsoil; on uplands

This association is characterized by high, rounded cherty knobs and winding ridges; long, steep slopes; and narrow, V-shaped valleys. It is on the highest knobs and hills along the eastern, southern, and western boundaries of the county (fig. 8). The knobs and ridges rise 200 to 300 feet above the floors of the narrow valleys and have side slopes 1,000 to 1,500 feet long and slopes of mostly more than 25 percent. All of the rock strata that underlie this association are level bedded. Blocky shale 4 to 10 feet thick separates the

Figure 8.—**Typical landscape in the Dellrose-Mimosa-Bodine association. Dellrose and Mimosa soils are on the steep slopes in the foreground, and Bodine soils are on the wooded ridgetops and steep upper side slopes.**

chert beds that cap the upper one-third of the hills from the phosphatic limestone that underlies the lower part.

This association makes up about 3 percent of the county. It is 20 percent Dellrose soils, 20 percent Mimosa soils, and 20 percent Bodine soils. The rest is minor soils.

The Dellrose soils formed in cherty creep or colluvium on long, steep hillsides. Slopes are dominantly 25 to 40 percent. The loamy, cherty creep or colluvium ranges from about 40 inches to 7 feet in thickness and generally overlies 1 foot to 3 feet of yellowish clay that extends to limestone bedrock. These soils typically have a surface layer of dark-brown cherty silt loam and a subsoil of brown and strong-brown cherty silty clay loam.

The Mimosa soils generally are on the lower slopes below the Dellrose soils and have slopes of mainly 15 to 35 percent. These soils typically have a surface layer of brown cherty silt loam and a subsoil of yellowish-brown, plastic clay that has moderately slow permeability. Depth to bedrock ranges from about 40 to 60 inches, but there are outcrops of limestone in some areas.

The very cherty Bodine soils are on ridgetops and the steep upper side slopes of the hills and knobs. Slopes are 5 to 45 percent. These soils typically have a surface layer of brown cherty silt loam and a subsoil of yellowish-brown cherty silt loam or cherty silty clay loam. They range from about 15 percent chert in the surface layer to as much as 80 percent chert in the subsoil.

Among the minor soils are small areas of Ashwood and Inman soils on uplands and narrow strips of Cannon, Lynnville, Egam, Armour, and Capshaw soils along the valley floors.

About 65 percent of the association is in heavily cutover woodland consisting mainly of oak, hickory, yellow-poplar, and redcedar trees. The rest is cleared and used mainly for pasture. A young growth of black locust trees has volunteered on most of the idle fields.

The average farm in this association is about 325 acres in size. Steepness limits farming mainly to raising beef cattle. Trees grow well on most of the steep hillsides, and a few farmers have some income from the sale of wood products. Good pasture can be grown on the steep hillsides, but preparation of the seedbed, application of lime and fertilizer, and mowing are difficult. If enough lime and fertilizer are used, fair yields of most crops and good pasture can be produced on the ridgetops. A large percentage of the pasture is unimproved, and many fields are idle. About half of the

Figure 9.—**Typical landscape in the Stiversville-Sandhill-Inman association. The higher hills in the background are in the Dellrose-Mimosa-Bodine association.**

farmers supplement their income by working off the farm 100 days or more a year.

Steepness presents the main engineering hazard on soils of this association. The cherty soils on winding ridgetops are better for development of housing and roads than the other soils in the association, but accessibility to these sites is a major concern. Highway construction is very hazardous on the Mimosa and Dellrose soils. If deep cuts and fills are made on steep hillsides of these soils, they are likely to slip and slide.

7. Stiversville-Sandhill-Inman Association

Well-drained, gently sloping to steep phosphatic soils that have a loamy or clayey subsoil; on uplands

This association consists of hills and knobs; narrow, winding ridgetops; and dominant, steep hillsides (fig. 9). The areas are deeply dissected by numerous drainageways or hollows, and seep spots and intermittent springs are common near the bases of the steep side slopes. Slopes are mostly 12 to 40 percent, but they range to 2 percent on the ridgetops. All of the association is underlain by interbedded phosphatic limestone and shale.

This association makes up about 2 percent of the county. It is about 40 percent Stiversville soils, 15 percent Sandhill soils, and 15 percent Inman soils. The rest is minor soils.

Most of the Stiversville soils are on the ridgetops, but some are on the steep side slopes. These soils are well drained and contain a considerable amount of sand. Typically, the surface layer is brown silt loam and the subsoil is brown and reddish-brown clay loam. Depth to hard bedrock ranges from 40 to 65 inches.

The Sandhill soils are on the steep side slopes. These soils are well drained and contain flat fragments of leached sandy limestone that commonly increase both in size and amount with increasing depth. Typically, the surface layer is dark-brown channery loam and the subsoil is brown channery and flaggy clay loam. Depth to hard bedrock ranges from 40 inches to 6 feet.

The Inman soils are commonly on steep side slopes. Where not severely eroded, they have a thin surface layer of brown flaggy silt loam and a subsoil of yellowish-brown, moderately slowly permeable, plastic, flaggy silty clay or clay. These soils have soft and hard flagstones on the surface and throughout the soil. Depth to hard bedrock ranges from 20 to 40 inches.

Among the minor soils are Hampshire and Mimosa soils on uplands; Armour, Nesbitt, and Capshaw soils on toe slopes, fans, and terraces; and Arrington, Lynnville, Egam, Melvin, and Roellen soils in narrow bands along streams.

About 80 percent of this association has been cleared. Corn, crops for silage and hay, small grain, and burley tobacco are grown on the more gently rolling soils on uplands. The steep hillsides are used mainly for pasture, but a fairly large acreage of them is in heavily cutover hardwood trees and a few areas are idle. Most rocky areas are thinly forested, mainly with redcedar, hickory, oak, elm, and hackberry trees. A few scattered yellow-poplar and black walnut trees grow on the steep slopes, and black locust trees have volunteered on most of the idle land.

The average farm in this association is about 150 acres in size. Raising beef cattle is the main farm enterprise. Corn, small grain, silage, and hay are the main crops. Although the total acreage is small, burley tobacco is the principal cash crop on a few farms. About 40 percent of the farmers supplement their income by working off the farm 100 days or more a year.

Steepness, the high content of clay, the low bearing strength, and the moderately slow permeability of the Inman soils present severe engineering hazards for uses that require large tracts of land. The Stiversville soils on the ridgetops provide good sites for most uses. All trees, shrubs, grasses, and legumes common to this area make good growth on most of the soils of this association.

8. Roellen-Tupelo-Capshaw Association

Poorly drained to moderately well drained, nearly level to gently sloping soils that have a clayey subsoil; on bottom lands, low stream terraces, and uplands

This association consists of broad areas of nearly level and gently sloping soils on uplands and terraces that rise only a few feet above relatively wide bottom lands along small, meandering streams. All of the association is underlain by level-bedded limestone that crops out in a few places. Slopes range from 0 to 5 percent.

This association makes up about 8 percent of the county. It is about 30 percent Roellen soils, 10 percent Tupelo soils, and 10 percent Capshaw soils. The rest is minor soils.

The poorly drained Roellen soils are the dominant soils along the streams. These soils typically have a surface layer of very dark gray silty clay and clay and a subsoil of dark-gray clay.

The somewhat poorly drained Tupelo soils are on low stream terraces and broad flats or in depressions on uplands. These soils have a surface layer of brown or dark grayish-brown silt loam and a subsoil of silty clay or clay that is dominantly olive brown or yellowish brown and mottled with gray.

The moderately well drained, nearly level and gently sloping Capshaw soils are on stream terraces and uplands. These soils are generally in a slightly higher position than the Tupelo and Roellen soils. They have a surface layer of brown or dark grayish-brown silt loam and a subsoil of yellowish-brown or strong-brown clay that is mottled with gray below a depth of 18 to 20 inches. All these soils are more than 40 inches deep to limestone bedrock.

Among the minor soils are small areas of Talbott, Bradyville, Lomond, Cumberland, Harpeth, and Byler soils and a few areas of Rock outcrop scattered through the gently sloping uplands. The poorly drained Dowellton and Almaville soils and the somewhat poorly drained Woodmont soils are on upland flats. A few areas of Arrington, Egam, Eagleville, and Dilton soils are on narrow bottom lands.

About 70 percent of this association has been cleared and is used mainly for row crops and pasture. The few rocky areas are in heavily cutover woodland consisting mainly of redcedar, hickory, oak, elm, and hackberry trees. Several large tracts of the wet soils are in woodland consisting of oak, blackgum, and other water-tolerant trees.

The average farm in this association is about 325 acres in size. Corn, small grain, grain sorghum, and hay and silage are the main crops. About half of the pastures are improved, and soybeans and annual lespedeza overseeded in small grain are the chief hay crops. Beef cattle and dairy cattle are the main livestock raised. About 30 percent of the farmers supplement their income by working off the farm 100 days or more a year.

The wetness and the slow permeability present severe engineering hazards for development of roads, industry, and housing. The Roellen soils are subject to frequent flooding. The area is suited to farming and natural recreation. Good tilth is difficult to maintain on most of the soils because hard clods form on the surface if the soils are worked when too wet. Drainage is needed to remove excess surface water. Outcrops of rock and shallowness to bedrock in many of the minor soils make drainage and tillage difficult.

9. Armour-Arrington-Egam Association

Well drained and moderately well drained, nearly level to sloping soils that have a loamy or clayey subsoil; mainly on bottom lands and stream terraces

This association consists mainly of broad, nearly level to rolling, low stream terraces that lie a few feet higher than the adjacent first bottoms. The association parallels large streams (fig. 10). The largest area is along the East Fork Stones River, and small areas are along the Harpeth River and Nelson and Overall Creeks. Slopes range from 0 to 12 percent.

This association makes up about 2 percent of the county. It is about 25 percent Armour soils, 25 percent Arrington soils, and 20 percent Egam soils. The rest is small areas of minor soils.

The Armour soils are on stream terraces and foot slopes of the uplands. These soils are well drained. They have a surface layer of brown silt loam and a subsoil of brown silty clay loam.

The Arrington soils are on the flood plains and in small depressions within the terraces. These soils are well drained. They have a surface layer of dark-brown

Figure 10.—Typical landscape in the Armour-Arrington-Egam association. Arrington and Egam soils are along the stream, and Armour soils are on the second bottom.

silt loam and a subsoil of dark-brown and dark grayish-brown silt loam and silty clay loam.

The moderately well drained Egam soils are on flood plains. These soils have a thick surface layer of dark-brown to very dark brown silt loam and silty clay loam and a subsoil of dark grayish-brown silty clay and clay.

Among the minor soils are the Roellen, Eagleville, Melvin, and Lynnville soils on flood plains; small areas of Rock outcrop and Talbott, Bradyville, and Barfield soils on uplands; and Nesbitt, Byler, Capshaw, Woodmont, Tupelo, Dowellton, and Almaville soils on stream terraces.

Most of this association has been cleared and is used for crops, hay, and pasture. The only wooded areas are rocky uplands and a few swampy areas on bottom lands. All of the major soils and many of the minor soils in this association are fertile, easy to work, and well suited to most locally grown crops and pasture.

The average farm in this association is about 175 acres in size. Corn, small grain, grain sorghum, soybeans, and lespedeza are the main crops. Dairy cows, beef cattle, and hogs are the main livestock raised. About three-fourths of the pasture is improved. About 40 percent of the farmers supplement their income by working off the farm 100 days or more a year.

The hazard of flooding makes practically all of the soils on first bottoms in this association poorly suited to all uses except farming and recreation. Both natural and developed recreation have seasonal limitations because of wetness and overflow during seasons of highest rainfall. Most of the soils are highly productive of all species of trees, shrubs, grasses, and legumes common in this area. The Arrington soils are a good source of topsoil, and both Arrington and Armour soils are a good source of fill material used in landscaping.

Descriptions of the Soils

This section describes the soil series and mapping units in Rutherford County. The procedure is first to describe each soil series and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read both the description of that unit and the description of its series.

Each soil series contains two descriptions of a soil profile. The first is brief and in terms familiar to a layman. The second, detailed and in technical terms, is for scientists, engineers, and others who need to make thorough and precise studies of soils.

Preceding the name of each mapping unit is a symbol that identifies the mapping unit on the detailed soil

TABLE 3.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Almaville silt loam	645	0.2
Armour silt loam, 0 to 2 percent slopes	1,355	.3
Armour silt loam, 2 to 5 percent slopes	3,260	.8
Armour silt loam, 5 to 12 percent slopes	550	.1
Arrington silt loam	8,695	2.1
Ashwood silty clay loam, 5 to 12 percent slopes	255	.1
Ashwood silty clay loam, 12 to 20 percent slopes	220	.1
Barfield silty clay loam, 1 to 8 percent slopes	2,915	.7
Bodine cherty silt loam, 5 to 15 percent slopes	755	.2
Bodine cherty silt loam, 20 to 45 percent slopes	1,285	.3
Bradyville silt loam, 0 to 2 percent slopes	5,225	1.3
Bradyville silt loam, 2 to 5 percent slopes	19,425	5.0
Bradyville silt loam, 5 to 12 percent slopes, eroded	1,895	.5
Bradyville silty clay loam, 2 to 5 percent slopes, severely eroded	5,580	1.4
Bradyville silty clay loam, 5 to 12 percent slopes, severely eroded	875	.2
Bradyville-Rock outcrop complex, 0 to 2 percent slopes	4,095	1.0
Bradyville-Rock outcrop complex, 2 to 12 percent slopes	11,480	2.7
Bradyville-Urban land complex	2,075	.5
Byler silt loam, 0 to 2 percent slopes	1,650	.4
Byler silt loam, 2 to 5 percent slopes	1,365	.3
Cannon cherty silt loam	540	.2
Capshaw silt loam, 0 to 2 percent slopes	6,430	1.7
Capshaw silt loam, 2 to 5 percent slopes	3,450	.9
Cumberland silt loam, 0 to 2 percent slopes	4,140	1.1
Cumberland silt loam, 2 to 5 percent slopes	15,580	3.8
Cumberland silt loam, 5 to 12 percent slopes, eroded	1,290	.3
Cumberland silty clay loam, 2 to 5 percent slopes, severely eroded	1,545	.4
Cumberland silty clay loam, 5 to 12 percent slopes, severely eroded	545	.2
Dellrose cherty silt loam, 5 to 12 percent slopes	330	.1
Dellrose cherty silt loam, 12 to 30 percent slopes	680	.2
Dellrose cherty silt loam, 30 to 40 percent slopes	1,560	.4
Dilton-Rock outcrop complex	4,960	1.2
Dowellton silt loam	3,275	.8
Eagleville silty clay loam	6,090	1.5
Egam silt loam	14,830	3.7
Gladeville-Rock outcrop-Talbott association, rolling	93,325	23.1
Gullied land	2,150	.5
Hampshire silt loam, 2 to 5 percent slopes	615	.2
Hampshire silt loam, 5 to 12 percent slopes, eroded	1,030	.3
Hampshire silt loam, 12 to 20 percent slopes, eroded	455	.1
Hampshire silty clay loam, 5 to 12 percent slopes, severely eroded	405	.1
Hampshire silty clay loam, 12 to 20 percent slopes, severely eroded	420	.1
Harpeth silt loam, 0 to 2 percent slopes	15,300	3.8
Harpeth silt loam, 2 to 5 percent slopes	2,380	.6
Hillwood gravelly silt loam, 2 to 12 percent slopes	2,055	5
Hillwood gravelly silt loam, 12 to 20 percent slopes	635	.2
Inman flaggy silt loam, 5 to 12 percent slopes	2,685	.7
Inman flaggy silty clay loam, 12 to 30 percent slopes	4,150	1.1
Lomond silt loam, 0 to 2 percent slopes	8,065	1.6
Lomond silt loam, 2 to 5 percent slopes	10,520	2.7
Lynnville silt loam	3,985	1.0
Melvin silt loam	485	.1
Mimosa-Rock outcrop complex, 5 to 20 percent slopes	1,545	.4
Mimosa-Rock outcrop complex, 20 to 40 percent slopes	17,290	4.2
Mimosa soils, 5 to 12 percent slopes	480	.1
Mimosa soils, 12 to 20 percent slopes	735	.2
Mimosa soils, 20 to 30 percent slopes	990	.3
Nesbitt silt loam, 0 to 2 percent slopes	1,390	.4
Nesbitt silt loam, 2 to 5 percent slopes	1,005	.2
Pits and Dumps	675	.1
Roellen silty clay loam	5,960	1.4
Roellen silty clay	5,315	1.3
Sandhill channery loam, 12 to 20 percent slopes	345	.1
Sandhill channery loam, 20 to 30 percent slopes	890	.2
Stiversville silt loam, 2 to 5 percent slopes	675	.2
Stiversville silt loam, 5 to 12 percent slopes	1,645	.4
Stiversville silt loam, 12 to 20 percent slopes	810	.2
Stiversville silt loam, 20 to 40 percent slopes	500	.1
Talbott silt loam, 0 to 2 percent slopes	1,990	.5
Talbott silt loam, 2 to 5 percent slopes, eroded	16,985	4.1
Talbott silt loam, 5 to 12 percent slopes, eroded	5,815	1.5
Talbott silty clay loam, 2 to 5 percent slopes, severely eroded	5,255	1.3
Talbott silty clay loam, 5 to 12 percent slopes, severely eroded	5,340	1.4
Talbott silty clay loam, 12 to 20 percent slopes, severely eroded	425	.1
Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes	28,115	7.0
Tupelo silt loam	4,345	1.1
Woodmont silt loam	1,315	.3
Water, borrow pits, limestone quarries, etc.	5,860	1.5
Total	403,200	100.0

map. Listed at the end of each description are the capability unit and the woodland group in which the mapping unit has been placed. The page on which each capability unit is described can be found by referring to the "Guide to Mapping Units" at the back of this survey.

The approximate acreage and proportionate extent of each mapping unit are shown in table 3. Many terms used in describing the soils can be found in the Glossary at the back of this survey.

Almaville Series

The Almaville series consists of poorly drained, deep loamy soils. These soils have a fragipan at a depth of 20 to 36 inches. These soils formed in old silty alluvium or in a thick mantle of loess that is underlain in most places by clayey limestone residuum. They are on broad upland flats and low stream terraces. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is dark-gray and gray silt loam about 8 inches thick. The subsoil is gray, friable silt loam mottled with light olive

brown that extends to a depth of about 25 inches. Below this is a fragipan of light brownish-gray and gray, firm and brittle silt loam and silty clay loam mottled with yellowish brown and light olive brown. The fragipan extends to a depth of more than 60 inches.

Representative profile of Almaville silt loam:

Ap—0 to 5 inches, dark-gray (10YR 4/1) silt loam; few, fine, distinct, light-gray mottles; weak, fine, granular structure; very friable; many fine roots; common small, brown concretions; slightly acid; abrupt, smooth boundary.

A2—5 to 8 inches, gray (10YR 6/1) silt loam; weak, fine and medium, platy structure; friable; common fine roots; common small, brown concretions; few small, white chert fragments; strongly acid; clear, wavy boundary.

Bg—8 to 25 inches, gray (10YR 6/1) silt loam; common, medium, distinct, light olive-brown (2.5Y 5/6) mottles; weak, fine, subangular blocky structure; friable; few fine roots; few small, brown concretions; few small chert fragments; strongly acid; clear, wavy boundary.

Bx1—25 to 28 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine, distinct, light olive-brown (2.5Y 5/6) mottles; weak, medium, platy structure; slightly brittle; few fine roots; common medium, brown concretions; strongly acid; clear, irregular boundary.

Bx2—28 to 40 inches, light brownish-gray (2.5Y 6/2) silty clay loam; few, medium, distinct, light olive-brown (2.5Y 5/6) mottles; weak, coarse, prismatic structure parting to weak, medium, platy and angular blocky; very firm and brittle in more than 80 percent of the cross-section; indistinct polygonal veins of friable, grayish silt and clay; concentrations of fine roots in some polygonal veins; common voids; patchy clay films; common medium and large, black and brown concretions; few small chert fragments; medium acid; gradual, wavy boundary.

Bx3—40 to 72 inches, gray (N 6/0) silty clay loam; many, medium, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, medium, platy and angular blocky; very firm and brittle in more than 75 percent of the cross-section; indistinct polygonal veins of friable, grayish silt and clay; patchy clay films, especially in pores and lining former vertical channels; common fine voids; common medium, brown concretions; few chert fragments; neutral.

Depth to the fragipan ranges from 20 to 36 inches. Depth to limestone bedrock ranges from about 5 to 8 feet or more.

The A horizon is dark-gray, gray, light brownish-gray, grayish-brown, or dark grayish-brown, friable silt loam 4 to 10 inches thick. In forested areas the soil commonly has a very dark gray A1 horizon 1 inch to 5 inches thick. The Bg horizon is gray, light-gray, or light brownish-gray, friable silt loam that typically has few to common mottles in shades of brown and yellow. The Bx horizon is gray, light brownish-gray, or light-gray silt loam or silty clay loam that is commonly mottled with shades of brown, yellow, and olive. Clay that weathered from limestone is at a depth of 4 to 8 feet or more.

Ae—Almaville silt loam. This nearly level, poorly drained loamy soil is on upland flats and low stream terraces. It has a fragipan at a depth of 20 to 36 inches. The surface layer is 4 to 10 inches thick, and limestone is at a depth of 5 to 8 feet or more.

This soil ranges from strongly acid to slightly acid above the fragipan and from strongly acid to mildly alkaline in the fragipan. It commonly becomes less acid with increasing depth. The subsoil is poorly aerated, and the fragipan is slowly permeable. During wet periods, a perched water table above the fragipan keeps the upper part of the soil saturated for long periods. During long dry periods, the soil dries out and is droughty. Runoff is slow, and ponding is common.

Unless drainage is provided, this soil is poorly suited to most crops. In many areas drainage outlets are not available. The soil is better suited to crops and pasture plants that are both water tolerant and drought tolerant than to other uses. About half of the acreage has been cleared and is used mainly for pasture. A few areas are used for crops, and a few are idle. Capability unit IVw–1; woodland group 2w9.

Armour Series

The Armour series consists of well-drained, deep loamy soils. These soils formed in loamy old alluvium 30 inches to 8 feet thick and in the underlying clay that weathered from limestone. They are on stream terraces and foot slopes in the Outer Central Basin. Slopes range from 0 to 12 percent.

In a representative profile, the surface layer is dark-brown silt loam about 8 inches thick. The subsoil extends to a depth of 63 inches or more. The upper 5 inches is brown, friable silt loam; the middle 33 inches is brown and yellowish-brown, friable silty clay loam; and the lower 17 inches is yellowish-brown, firm clay.

Representative profile of Armour silt loam, 2 to 5 percent slopes:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; many fine roots; few small, black concretions; slightly acid; abrupt, smooth boundary.

B1—8 to 13 inches, brown (7.5YR 4/4) silt loam; few, fine, faint, dark-brown mottles; weak, fine and medium, subangular blocky structure; friable; many fine roots; few small, black concretions; slightly acid; clear, smooth boundary.

B21t—13 to 21 inches, brown (7.5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; few small, black concretions; medium acid; clear, smooth boundary.

B22t—21 to 36 inches, brown (7.5YR 4/4) silty clay loam; few, fine, faint, strong-brown, yellowish-brown, and light yellowish-brown mottles; moderate, medium, subangular blocky structure; friable; patchy clay films; few fine roots; common small and medium, black concretions; few small chert pebbles; medium acid; clear, smooth boundary.

B23t—36 to 46 inches, yellowish-brown (10YR 5/4) silty clay loam; few, fine, faint, strong-brown and pale-brown mottles; weak, fine and medium, subangular and angular blocky structure; friable; patchy clay films; few fine roots in upper 6 inches; common small and medium, black concretions; many peds coated with concretionary stains; strongly acid; gradual, wavy boundary.

IIB3—46 to 63 inches, yellowish-brown (10YR 5/6) clay; few, fine and medium, faint, strong-brown (7.5YR 5/6) and pale-brown (10YR 6/3) mottles; weak, coarse, angular blocky structure to massive; firm; common small and medium, black concretions; medium acid.

The old alluvium ranges from 30 inches to 8 feet in thickness. Depth to limestone bedrock ranges from about 4 to 8 feet or more. Reaction ranges from medium acid to strongly acid throughout the profile except where limed.

The Ap horizon ranges from 5 to 10 inches in thickness. The B horizon is brown, dark yellowish-brown, or reddish-

brown silt loam or silty clay loam. The IIB horizon commonly has yellower colors and contains more clay than the overlying B horizon, which formed in alluvium.

AmA—Armour silt loam, 0 to 2 percent slopes. This deep, well-drained loamy soil is on terraces along streams that head in the Outer Central Basin. The surface layer is dark-brown silt loam 5 to 12 inches thick. The subsoil, to a depth of about 3 or 4 feet or more, is dominantly brown, friable silty clay loam that formed in old alluvium. Below this is yellowish-brown, firm clay. Depth to limestone bedrock ranges from about 4 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are less than 40 inches deep to bedrock.

This soil is medium acid to strongly acid throughout except where limed. It is medium to high in content of phosphorus. It has a deep root zone. A few low-lying areas are subject to occasional flooding. Available water capacity is high.

This soil is well suited to all the commonly grown crops. It is used for row crops, hay, and pasture. Capability unit I–1; woodland group 2o7.

AmB–Armour silt loam, 2 to 5 percent slopes. This deep, well-drained loamy soil is on terraces along streams that head in the Outer Central Basin and on foot slopes in the valleys of the Outer Central Basin. It has the profile described as representative of the series. The surface layer is dark-brown silt loam 5 to 10 inches thick. The subsoil is dominantly brown, friable silty clay loam underlain at a depth of 3 or 4 feet or more by yellowish, firm clay. Limestone bedrock is at a depth of about 4 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are less than 40 inches deep to limestone bedrock. Also included are small areas of soils that have a few outcrops of rock and a few areas of soils that have gravel or chert on the surface and throughout the soil.

This soil is medium acid to strongly acid throughout except where limed. It is medium to high in content of phosphorus. It has a deep root zone. Available water capacity is high.

This soil is well suited to all the commonly grown crops. It is used for row crops, hay, and pasture. Controlling erosion is the main concern of management. Capability unit IIe–1; woodland group 2o7.

AmC—Armour silt loam, 5 to 12 percent slopes. This deep, well-drained loamy soil is on foot slopes in the valleys of the Outer Central Basin and on terraces along streams that head in the Outer Central Basin. The surface layer is dark-brown silt loam 4 to 10 inches thick. The subsoil, to a depth of 3 or 4 feet or more, is dominantly brown, friable silty clay loam. In a few places it is as much as 10 percent, by volume, chert pebbles. Below this, it is yellowish, firm clay. Depth to bedrock ranges from about 4 to 8 feet. In many places there is a concentration of chert at or just above the contact with the clay.

Included with this soil in mapping are a few areas of severely eroded soils that have a thin, brown surface layer. Also included are small areas of soils that have outcrops of rock and a few areas of soils that are less than 40 inches deep to limestone bedrock.

This soil is medium acid to strongly acid throughout except where limed. It is medium to high in content of phosphorus. It has a deep root zone. Available water capacity is high.

This soil is well suited to all the commonly grown crops. It is used for row crops, hay, and pasture. Controlling erosion is the main concern of management. Capability unit IIIe–1; woodland group 2o7.

Arrington Series

The Arrington series consists of well-drained, deep loamy soils. These soils formed in recently deposited sediment washed from soils derived mainly from limestone. They are on first bottoms and in small depressions. Slopes range from 0 to 3 percent.

In a representative profile (fig. 11), the surface layer is dark-brown, friable silt loam about 28 inches thick. The subsoil is dark-brown and dark grayish-brown, friable silt loam and silty clay loam about 30 inches thick. Below this is very dark grayish-brown silty clay.

Representative profile of Arrington silt loam:

Ap—0 to 6 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; many fine roots; slightly acid; clear, smooth boundary.

A12—6 to 28 inches, dark-brown (10YR 3/3) silt loam; moderate, fine and medium, granular structure; friable; common fine roots; few small, dark-brown and black concretions; slightly acid; gradual, wavy boundary.

B21—28 to 40 inches, dark-brown (10YR 4/3) silt loam; weak, fine and medium, granular structure; friable; few fine roots; few small and medium, black concretions; slightly acid; clear, smooth boundary.

Figure 11.—**This profile of Arrington silt loam shows stratified silt loam and chert pebbles.**

B22—40 to 58 inches, dark grayish-brown (10YR 4/2) silty clay loam; few, medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, fine, subangular blocky structure parting to moderate, fine and medium, granular; friable; few fine roots; neutral, clear, wavy boundary.

IIC—58 to 70 inches, very dark grayish-brown (10YR 3/2) silty clay; few, fine, distinct, grayish-brown (10YR (5/2) mottles; weak, fine and medium, subangular blocky structure parting to moderate, medium, granular; friable; few small, black concretions; mildly alkaline.

The alluvium ranges from about 40 inches to 8 feet or more in thickness. The soil in upland depressions and along small streams formed in alluvium that is thinner and redder than that on the flood plains of large streams. Reaction ranges from slightly acid to mildly alkaline throughout.

The A horizon ranges from 24 to 36 inches in thickness. The alluvium commonly overlies clayey limestone residuum. In places there are a few angular chert fragments or water-rounded pebbles throughout the soil.

Ar—Arrington silt loam. This deep, well-drained loamy soil is on flood plains, along drainageways, and in shallow depressions. It is dark-brown, friable silt loam to a depth of 3 feet or more. Slopes range from 0 to 3 percent.

Included with this soil in mapping are a few areas of soils that are firm clay at a depth of 30 to 40 inches. Also included are a few areas of soils that have a surface layer of dark-brown silt loam 20 to 24 inches thick.

This soil is slightly acid to mildly alkaline throughout. It is naturally fertile. Along streams that head in the Outer Central Basin, the soil is medium to high in content of phosphorus. Most areas are subject to occasional and very brief flooding or ponding. Permeability is moderate, and available water capacity is high.

This soil is well suited to commonly grown crops. It can be cultivated every year. Most areas have been cleared and are used for crops and pasture. The response to management is good. Capability unit I–1; woodland group 2o7.

Ashwood Series

The Ashwood series consists of well-drained, moderately deep soils. These soils formed in clayey residuum weathered from limestone that is medium to high in content of phosphorus. They are on uplands. Slopes range from 5 to 20 percent.

In a representative profile, the surface layer is very dark grayish brown and about 13 inches thick. The upper 5 inches of the surface layer is friable silty clay loam, the next 4 inches is friable silty clay, and the lower 4 inches is firm clay. The subsoil is yellowish-brown, very firm clay. Limestone bedrock is at a depth of 36 inches.

Representative profile of Ashwood silty clay loam, 12 to 20 percent slopes:

Ap—0 to 5 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, medium, granular structure; friable; many fine roots; slightly acid; clear, smooth boundary.

A12—5 to 9 inches, very dark grayish-brown (10YR 3/2) silty clay; strong, fine and medium, granular structure; friable; many fine roots; slightly acid; clear, wavy boundary.

A13—9 to 13 inches, very dark grayish-brown (10YR 3/2) clay; moderate, fine and medium, subangular blocky structure; firm; common fine roots; slightly acid; clear, wavy boundary.

B21t—13 to 19 inches, yellowish-brown (10YR 5/4) clay; few streaks and channels all very dark grayish brown (10YR 3/2); moderate; medium, subangular and angular blocky structure; very fine; patchy clay films; few fine roots; slightly acid; clear, wavy boundary.

B22t—19 to 25 inches, yellowish-brown (10YR 5/4) clay; moderate, fine and medium, angular blocky structure; very firm; patchy clay films; few fine roots; few small, black concretions; slightly acid; clear, wavy boundary.

B23t—25 to 36 inches, yellowish-brown (10YR 5/6) clay; few, fine, faint, light olive-brown and light brownish-gray mottles; weak, fine, angular blocky structure; very firm; patchy clay films; few thin slabs of hard limestone; neutral.

R—36 inches, phosphatic limestone.

Depth to bedrock ranges from 20 to 40 inches. Reaction is medium acid to mildly alkaline throughout.

The A horizon is dark brown, very dark brown, or very dark grayish brown and 7 to 20 inches thick. It ranges from silt loam to silty clay in the upper part and from silty clay to clay in the lower part. In places there are a few chert fragments on the surface and in the upper 4 to 6 inches of the A horizon. The B horizon is dominantly brown, strong-brown, yellowish-brown, or light olive-brown clay. The lower 10 to 12 inches of the B horizon generally has few to common mottles in various shades of yellow, brown, olive, and gray.

AsC—Ashwood silty clay loam, 5 to 12 percent slopes. This well-drained soil is on uplands. The surface layer is very dark grayish brown, very dark brown, or dark brown and is 7 to 20 inches thick. The upper part of the surface layer is friable silty clay loam, and the lower part is friable to firm clay, silty clay, or silty clay loam. The surface commonly cracks during prolonged dry periods. The subsoil is yellowish-brown, strong-brown, or light olive-brown, firm clay. Depth to limestone bedrock ranges from 20 to 40 inches.

Included with this soil in mapping are a few areas of soils that are more than 40 inches or less than 20 inches deep to bedrock and small areas of soils that have a few outcrops of rock. Also included are a few areas of soils that have a dark-colored surface layer less than 7 inches thick.

This soil is medium acid to mildly alkaline. In most places it is medium to high in content of phosphorus. Runoff is medium to rapid, permeability is moderately slow, and available water capacity is medium.

This soil is suited to pasture and moderately suited to most commonly grown crops. It is better suited to small grain, hay, and pasture than to row crops that require frequent tillage and large amounts of water in summer. About half of the acreage has been cleared and is used mainly for pasture. Trees in forested areas are mainly redcedar, locust, oak, hickory, elm, and hackberry. Capability unit IVe–3; woodland group 4o7.

AsD—Ashwood silty clay loam, 12 to 20 percent slopes. This well-drained soil is on uplands. It has the profile described as representative of the series. It has a clayey subsoil, and limestone bedrock is at a depth of 20 to 40 inches.

Included with this soil in mapping are a few areas of soils that are more than 40 inches or less than

20 inches deep to bedrock and areas of soils that have a few outcrops of rock. Also included are a few areas of soils that have a dark-colored surface layer less than 7 inches thick.

This soil is medium acid to mildly alkaline. In most places it is medium to high in content of phosphorus. Runoff is rapid, permeability is moderately slow, and available water capacity is medium.

This soil is suited to pasture plants and to most hay crops. It is highly susceptible to erosion. About one-third of the acreage has been cleared and is used mainly for pasture. Most of the pasture is unimproved, a few areas are idle, and some are reverting to trees. Trees in forested areas are mainly redcedar, locust, oak, hickory, elm, hackberry, and other hardwoods. Capability unit VIe–2; woodland group 4o7.

Barfield Series

The Barfield series consists of well-drained, shallow soils. These soils formed in residuum weathered from limestone. They are on uplands. Slopes range from 1 to 8 percent.

In a representative profile, the soil is very dark brown and very dark grayish-brown silty clay loam, silty clay, and clay about 12 inches thick. Below this is olive-brown, mottled, very firm clay that contains a moderate amount of weathered, coarse limestone fragments. Flat limestone bedrock is at a depth of 18 inches.

Representative profile of Barfield silty clay loam, 1 to 8 percent slopes:

Ap—0 to 6 inches, very dark brown (10YR 2/2) silty clay loam; moderate, fine and medium, granular structure; friable; many fine roots; common small, brown and black concretions; slightly acid; abrupt, smooth boundary.

B21—6 to 8 inches, very dark brown (10YR 2/2) silty clay; common, medium, faint, dark-brown (7.5YR 3/2) mottles; moderate, fine and medium, angular and subangular blocky structure; friable; common fine roots; common small and medium, brown and black concretions; few small, weathered chert fragments; neutral; clear, wavy boundary.

B22—8 to 12 inches, very dark grayish-brown (10YR 3/2) clay; common, fine and medium, distinct, brown (7.5YR 4/4) and olive-brown (2.5Y 4/4) mottles; few thin streaks of very dark brown (10YR 2/2) coating cracks and filling old root channels; moderate, medium, angular blocky structure; firm; common fine roots; common small, dark-brown and black concretions; neutral; clear, wavy boundary.

B3—12 to 16 inches, olive-brown (2.5Y 4/4) clay; many, medium, distinct, strong-brown (7.5YR 5/6) and light olive-brown (2.5Y 5/4) mottles; few thin streaks of very dark grayish brown (10YR 3/2) coating cracks and filling old root channels; weak, medium, angular blocky structure; very firm; few fine roots; common small and medium, reddish-brown and black concretions; common weathered slabs of limestone 2 to 8 inches long and ¼ to 1 inch thick; mildly alkaline; clear, wavy boundary.

C—16 to 18 inches, mottled olive-brown (2.5Y 4/4) dark grayish-brown (2.5Y 4/2), and yellowish-brown (10YR 5/6) clay; about 25 percent, by volume, slabs of weathered limestone 4 to 10 inches long and ½ inch to 3 inches thick; massive; very firm; common small and medium, reddish-brown and black concretions; mildly alkaline.

R—18 inches, limestone bedrock.

Depth to limestone bedrock ranges from about 10 to 20 inches. Reaction ranges from slightly acid to mildly alkaline throughout.

The A horizon is very dark brown, dark brown, or very dark grayish brown and ranges from about 3 to 8 inches in thickness. It is dominantly silty clay loam but ranges from silt loam to silty clay. The B horizon is very dark grayish-brown, brown, yellowish-brown, olive-brown, or light olive-brown, firm or very firm clay or silty clay that has few to many mottles in shades of brown, yellow, and olive. In places there is no C horizon, and the B horizon extends to bedrock. Where present, the C horizon is very firm, massive clay mottled with shades of brown, yellow, olive, and gray. It is commonly 15 to 25 percent, by volume, limestone fragments.

BaC—Barfield silty clay loam, 1 to 8 percent slopes. This shallow, well-drained soil is on uplands. It formed in residuum weathered from limestone. It ranges from 10 to 20 inches deep to limestone.

Included with this soil in mapping are a few areas of soils that are more than 20 inches deep to rock and intermingled soils that have a few outcrops of rock.

This soil is slightly acid to mildly alkaline. The shallow depth to bedrock and the clayey subsoil limit the penetration of most plant roots and make the soil difficult to work. Permeability is moderately slow, and available water capacity is medium to low.

This soil is suited to drought-resistant plants seeded for pasture and hay. About two-thirds of the acreage has been cleared and is used mainly for pasture. Most pasture is unimproved, and a few areas are idle. Redcedar and hickory are the dominant trees in wooded areas. Capability unit VIe–2; woodland group 4d3.

Bodine Series

The Bodine series consists of well-drained to excessively drained, deep cherty soils. These soils formed in residuum derived from cherty limestone. They are on hillsides and the crests of high knobs and narrow, winding ridges in highly dissected areas of the Highland Rim. Slopes range from 5 to 45 percent.

In a representative profile, the surface layer is cherty silt loam about 7 inches thick. The upper 3 inches is very dark grayish brown, and the lower 4 inches is brown. The subsoil is yellowish-brown and light yellowish-brown, friable cherty silt loam that extends to a depth of 65 inches or more.

Representative profile of Bodine cherty silt loam, 20 to 45 percent slopes:

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) cherty silt loam; weak, fine, granular structure; very friable; many fine tree roots; about 25 percent, by volume, ¼- to 3-inch angular chert fragments; strongly acid; abrupt, smooth boundary.

A3—3 to 7 inches, brown (10YR 4/3) cherty silt loam; common, fine and medium, faint, very dark grayish-brown (10YR 3/2) mottles; moderate, fine and medium, granular structure; very friable; many fine and medium tree roots; about 30 percent, by volume, ¼- to 3-inch angular chert fragments; strongly acid; clear, wavy boundary.

B1—7 to 19 inches, yellowish-brown (10YR 5/4) cherty silt loam; common, fine and medium, faint, brown (10YR 4/3) and yellowish-brown (10YR 5/6) mottles; weak, fine and medium, subangular blocky structure; friable; common fine and medium tree roots; about 40 percent, by volume, 1- to 6-inch chert fragments; strongly acid; gradual, smooth boundary.

B2t—19 to 43 inches, yellowish-brown (10YR 5/6) cherty silt loam; common, fine and medium, faint, light yellowish-brown (10YR 6/4) and strong-brown (7.5YR 5/8) mottles; weak, medium, subangular blocky structure; friable; thin, patchy clay films; dark-brown stains on chert fragments; common medium and large tree roots; about 50 percent, by volume, 1- to 6-inch chert fragments; strongly acid; gradual, wavy boundary.

B3—43 to 65 inches, light yellowish-brown (10YR 6/4) cherty silt loam; common, fine and medium, faint, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few medium and large tree roots; about 75 percent, by volume, chert fragments; strongly acid.

The A horizon is 15 to 35 percent chert fragments, and the B horizon, 35 to 80 percent. Reaction is strongly acid to very strongly acid throughout the profile.

The A horizon ranges from about 5 to 12 inches in thickness. In cleared areas the Ap horizon commonly is brown, dark yellowish brown, or yellowish brown. The B horizon is yellowish-brown, light yellowish-brown, strong-brown, or reddish-yellow silt loam to silty clay loam.

BoC—Bodine cherty silt loam, 5 to 15 percent slopes. This well-drained to excessively drained cherty soil is on crests of high knobs and narrow, winding ridges on the Highland Rim. It has a surface layer of brown cherty silt loam 6 to 12 inches thick. The subsoil is yellowish-brown cherty silt loam or cherty silty clay loam. Chert fragments make up 35 to 75 percent of the subsoil.

Included with this soil in mapping are a few areas of soils that have a 10- to 20-inch silty mantle on the surface. This mantle is free or nearly free of chert.

This soil is strongly acid to very strongly acid throughout. Fertility is low. Permeability is moderately rapid, and available water capacity is low.

This soil is poorly suited to crops that require frequent tillage. It is suited to small grain, hay, and pasture. About one-third of the acreage has been cleared and is used mainly for pasture. Most pasture is unimproved. A few areas are used for crops, and a few are idle. Capability unit IVs–1; woodland group 3f8.

BoE—Bodine cherty silt loam, 20 to 45 percent slopes. This steep cherty soil is on the upper side slopes of high knobs and hills in highly dissected areas of the Highland Rim. It has the profile described as representative of the series. Chert fragments increase in size and amount with increasing depth, and the subsoil is 35 to 75 percent chert fragments.

Included with this soil in mapping are a few areas of soils that have a thick, dark-brown surface layer that formed in creep and is 15 to 30 percent chert fragments.

This soil is strongly acid to very strongly acid throughout. Fertilitv is low. Permeability is moderately rapid, and available water capacity is low.

This soil is too cherty and too steep to be suited to tilled crops. It is suitable for trees. The less sloping areas can be used for pasture. Only about 5 percent of the acreage has been cleared. Capability unit VIIs–1; woodland group 4f3.

Bradyville Series

The Bradyville series consists of well-drained, deep soils. These soils formed in a 15- to 30-inch mantle of old alluvium or mixed loess and alluvium and in the underlying clayey residuum weathered from limestone. They are on uplands of the Inner Central Basin. Slopes range from 0 to 12 percent.

In a representative profile, the surface layer is dark reddish-brown silt loam about 6 inches thick. The upper part of the subsoil, about 14 inches thick, is red, friable silty clay loam. The lower part is red and yellowish-red. firm clay mottled with shades of brown and yellow. Limestone bedrock is at a depth of 48 inches.

Representative profile of Bradyville silt loam, 2 to 5 percent slopes:

Ap—0 to 6 inches, dark reddish-brown (5YR 3/4) silt loam; moderate, medium, granular structure; friable; many fine roots; medium acid; abrupt, smooth boundary.

B21t—6 to 12 inches, red (2.5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; friable; patchy clay films; common fine roots; few small, dark-brown and black concretions; medium acid; clear, smooth boundary.

B22t—12 to 20 inches, red (2.5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; friable; continuous clay films; common fine roots; few small and medium, black and dark-brown concretions; medium acid; gradual, smooth boundary.

B23t—20 to 27 inches, red (2.5YR 4/6) clay; few, medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; strong, medium, subangular blocky structure; firm; continuous clay films; few fine roots; few small and medium, black concretions; few angular chert fragments as much as 2 inches across; medium acid; clear, smooth boundary.

B24t—27 to 36 inches, yellowish-red (5YR 4/6) clay; common, fine to coarse, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; very firm; continuous clay films; common small and medium, black concretions; few angular chert fragments as much as 2 inches across; medium acid; gradual, wavy boundary.

B25t—36 to 48 inches, yellowish-red (5YR 4/6) clay; many, medium and coarse, distinct, light yellowish-brown (10YR 6/4) mottles and few, fine, distinct, pale-brown mottles; weak, coarse and medium, subangular blocky structure; very firm; continuous clay films; few small and medium, black concretions; few thin slabs of hard limestone; medium acid.

R—48 inches, limestone rock.

Depth to limestone bedrock ranges from 40 to 60 inches. In places the soil has few to common pebbles or chert throughout the upper 15 to 30 inches, and in others there is a thin gravelly or cherty layer between depths of 15 and 30 inches. Reaction ranges from medium acid to strongly acid throughout, except that the layer just above bedrock ranges from medium acid to mildly alkaline.

The A horizon ranges from 4 to 12 inches in thickness. It is dark reddish-brown, dark-brown, or dark yellowish-brown silt loam. Where the A horizon has been severely eroded, it is strong-brown, red, and reddish-brown silty clay loam and finer textured material. The upper part of the B horizon is red, reddish-brown, yellowish-red, or strong-brown silty clay loam or silty clay. The lower part is red, yellowish-red, strong-brown, or yellowish-brown clay that commonly becomes yellower with increasing depth and is mottled with shades of yellow, brown, and olive. In places there is a thin C horizon generally of olive-brown clay just above the bedrock.

BrA—Bradyville silt loam, 0 to 2 percent slopes. This deep, nearly level, well-drained soil is on uplands of the Inner Central Basin. The surface layer is brown,

dark-brown, or dark reddish-brown, friable silt loam 6 to 12 inches thick. The upper part of the subsoil is reddish, friable silty clay loam; the lower part is reddish and yellowish, firm clay that commonly becomes yellower with increasing depth and is mottled with various shades of brown, yellow, and olive. Depth to limestone bedrock ranges from 40 to 60 inches.

Included with this soil in mapping are a few areas of soils that are more than 60 inches or less than 40 inches deep to bedrock and intermingled soils that have a few outcrops of rock.

This soil is medium acid to strongly acid, except for the layer just above bedrock. It has a deep root zone. Runoff is slow, permeability is moderate, and available water capacity is medium to high.

This soil is well suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared and is used for pasture, hay, small grain, and row crops. Much of the pasture is unimproved, and a few areas are idle. If this soil is well managed, it can be used intensively for crops. Capability unit I–2; woodland group 3o7.

BrB—Bradyville silt loam, 2 to 5 percent slopes. This deep, gently sloping, well-drained, reddish soil is on uplands of the Inner Central Basin. It has the profile described as representative of the series. The surface layer is 4 to 10 inches thick, and depth to limestone bedrock is 40 to 60 inches.

Included with this soil in mapping are a few areas of soils that are more than 60 inches or less than 40 inches deep to bedrock and intermingled soils that have a few outcrops of rock.

This soil is medium acid to strongly acid, except for the layer just above bedrock. It has a deep root zone. Runoff is medium, permeability is moderate, and available water capacity is medium to high.

This soil is suited to all commonly grown crops and pasture plants. About 90 percent of the acreage has been cleared and is used for pasture, small grain, hay, and row crops. Much of the pasture is unimproved, and many areas are idle. Response to management is good. Capability unit IIe–2; woodland group 3o7.

BrC2—Bradyville silt loam, 5 to 12 percent slopes, eroded. This deep, sloping, well-drained soil is on uplands of the Inner Central Basin. The surface layer is brown, dark-brown, or dark reddish-brown, friable silt loam 4 to 8 inches thick. In many places part of the reddish silty clay loam subsoil has been mixed with the plow layer. The subsoil, to a depth of 15 to 30 inches, is yellowish-red, red, dark-red, or strong-brown, friable silty clay loam of silty clay. Below this, it is red, yellowish-red, strong-brown, or yellowish-brown, firm clay that commonly becomes yellower and is mottled with various shades of brown, yellow, and olive with increasing depth. Depth to limestone bedrock is 40 to 60 inches.

Included with this soil in mapping are small spots of severely eroded soils that have a surface layer of silty clay loam or silty clay. Also included are a few areas of soils that are more than 60 inches or less than 40 inches deep to bedrock and small areas of intermingled soils that have a few outcrops of limestone.

This soil is medium acid to strongly acid, except for the layer just above bedrock. It has a deep root zone. Runoff is medium to rapid, permeability is moderate, and available water capacity is medium to high.

This soil is suited to all commonly grown crops and pasture plants. It is highly susceptible to erosion, especially in areas where cultivated crops are grown. Most of the acreage has been cleared and is used mainly for pasture, small grain, and hay. Much of the pasture is unimproved. Some areas are used for row crops, and some are idle. Capability unit IIIe–2; woodland group 3o7.

BsB3—Bradyville silty clay loam, 2 to 5 percent slopes, severely eroded. This gently sloping, well-drained soil is on uplands of the Inner Central Basin. Small rills and a few shallow gullies are common. The thin surface layer is reddish-brown, brown, strong-brown, or yellowish-brown silty clay loam or silty clay that is mostly material from the subsoil. The upper part of the subsoil, to a depth of 15 to 30 inches, is yellowish-red, red, dark-red, or strong-brown, friable silty clay loam or silty clay. Below this, it is red, yellowish-red, strong-brown, or yellowish-brown, firm clay that commonly becomes yellower and is mottled with various shades of brown, yellow, and olive with increasing depth. Depth to limestone bedrock ranges from 40 to 60 inches.

Included with this soil in mapping are intermingled soils that have a few outcrops of rock. Also included are a few areas of soils that are less than 40 inches or more than 60 inches deep to bedrock.

This soil is generally in poor tilth. Clods form if it is worked when wet. The soil is medium acid to strongly acid, except for the layer just above bedrock. Runoff is medium to rapid, permeability is moderate, and available water capacity is medium.

This soil is suited to most commonly grown crops and pasture plants. Because the soil is highly susceptible to erosion and has poor tilth, it is poorly suited to row crops that require frequent cultivation. It is better suited to small grain, hay, and pasture than to other uses. Most of the acreage has been cleared and is used mainly for pasture, but some is used for row crops and some is idle. Much of the pasture is unimproved. Capability unit IIIe–2; woodland group 4c3e.

BsC3—Bradyville silty clay loam, 5 to 12 percent slopes, severely eroded. This sloping, well-drained soil is on uplands of the Inner Central Basin. Small rills and a few shallow gullies are common. The thin surface layer is reddish-brown, brown, strong-brown, or yellowish-brown silty clay loam or silty clay that is mostly material from the subsoil. The upper part of the subsoil, to a depth of 15 to 30 inches, is yellowish-red, dark-red, red, or strong-brown, friable silty clay loam or silty clay. Below this, it is red, yellowish-red, strong-brown, or yellowish-brown, firm clay that commonly becomes yellower and is mottled with various shades of brown, yellow, and olive with increasing depth. Depth to limestone bedrock is 40 to 60 inches.

Included with this soil in mapping are intermingled soils that have a few outcrops of limestone. Also included are a few areas of soils that are more than 60 inches or less than 40 inches deep to bedrock.

This soil is generally in poor tilth. Clods form if it is worked when wet. The soil is medium acid to strongly acid, except for the layer just above bedrock.

Runoff is rapid, permeability is moderate, and available water capacity is medium.

This soil is suited to all commonly grown crops and pasture plants. It is highly susceptible to erosion, especially in areas where cultivated crops are grown. It is suited to small grain, hay, and pasture. Most of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and several areas are idle. A small acreage is used for row crops, and some is used for hay. Capability unit IVe–2; woodland group 4c3e.

BtA—Bradyville-Rock outcrop complex, 0 to 2 percent slopes. This complex consists of an intricate pattern of nearly level, well-drained soils and outcrops of limestone on uplands of the Inner Central Basin. Outcrops of limestone cover 5 to 25 percent of the land surface. In most areas the rock is even with or extends only 1 inch to 3 inches above the land surface. The Bradyville soil between the outcrops has a surface layer of brown, dark-brown, or dark reddish-brown, friable silt loam 5 to 10 inches thick. In most places the subsoil to a depth of 15 to 30 inches is yellowish-red, red, dark-red, or strong-brown, friable silty clay loam or silty clay. Below this, it is red, yellowish-red, strong-brown, or yellowish-brown, firm clay that commonly becomes yellower and is mottled with various shades of brown, yellow, and olive with increasing depth. Depth to limestone bedrock between the outcrops ranges from 40 to 60 inches.

Included with this complex in mapping are areas of soils, between the outcrops, that formed completely in old alluvium. The subsoil of some of these soils is dark-red, friable silty clay or clay that extends to a depth of more than 40 inches. In others it is yellowish-red, red, or strong-brown, friable silty clay loam throughout, and in some it has few to common chert fragments or rounded pebbles. Also included are a few areas of soils that are less than 40 inches or more than 60 inches deep to bedrock.

The Bradyville soil in this complex is medium acid to strongly acid in the upper part and medium acid to mildly alkaline in the layer just above bedrock. Permeability is moderate, and available water capacity is medium.

This complex is suited to most commonly grown crops and pasture plants. The outcrops of rock interfere with tillage, but the fields can be used intensively for crops that require only minimum tillage (fig. 12). The areas are suited to small grain, hay, and pasture. About three-fourths of the acreage has been cleared and is used mainly for pasture and hay. A fairly large acreage is used for row crops. Capability unit IVs–2; woodland group 4x3.

BtC—Bradyville-Rock outcrop complex, 2 to 12 percent slopes. This complex consists of an intricate pattern of gently sloping and sloping, well-drained soils and outcrops of limestone on uplands of the Inner Central Basin. Outcrops of limestone cover 5 to 25 percent of the land surface. In most areas the rock extends 3 to 10 inches above the land surface, but in some it is as much as 2 feet above the surface. The Bradyville soil between the outcrops has a surface layer of dark reddish-brown, brown, or dark-brown silt loam 4 to 10 inches thick. The subsoil to a depth of 15 to 30 inches is yellowish-red, red, dark-red, or strong-brown, friable silty clay loam, silty clay, or clay. Below this, it is red, yellowish-red, strong-brown, or yellowish-brown clay that commonly becomes yellower and is mottled with various shades of brown, yellow, and olive with increasing depth. Depth to limestone bedrock between the outcrops ranges from 40 to 60 inches.

Included with this complex in mapping are a few areas of intermingled soils that have outcrops of rock covering 25 to 50 percent of the land surface. About one-third of the complex is included areas of soils that formed completely in old alluvium. The subsoil of some of these soils is dark-red, friable silty clay or clay to a depth of more than 40 inches. In others it is yellowish-red, red, or strong-brown, friable silty clay loam or silty clay throughout, and in some it has few to common angular chert fragments or rounded pebbles. Also included are a few areas of soils that are more than 60 inches or less than 40 inches deep to limestone bedrock.

This complex is suited to most commonly grown crops and pasture plants. The outcrops of rock make tillage with machinery impractical. Permanent pasture can be grown, but clipping is difficult. About half of the acreage has been cleared and is used mainly for pasture. Most of the pasture is unimproved. Many areas are idle or have been abandoned and are reverting to trees, mostly redcedar. Capability unit VIs–2; woodland group 4x3.

Bu—Bradyville-Urban land complex. This complex consists of areas that have been artificially filled with earth, rock, or other debris and smoothed. Most of these areas are a part of landscaping or construction projects for urban and industrial development, where fill material has been moved and spread with heavy machinery. Bradyville soils are dominant in undisturbed parts of the areas.

The largest areas of this complex are on the former Stewart Air Base. Other areas, mostly in and around Murfreesboro and other urban areas in the county, consist chiefly of earth and rock fill used in leveling and landscaping for building sites.

This complex has little or no value for farming. Not placed in a capability unit or woodland group.

Byler Series

The Byler series consists of moderately well drained, deep loamy soils that have a fragipan at a depth of 18 to 34 inches. These soils formed in 3 to 6 feet of old alluvium or loess, or both, and in the underlying clay that weathered from limestone. They are on uplands and stream terraces of the Inner Central Basin. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is brown silt loam about 8 inches thick. The subsoil is brown and yellowish-brown, friable silt loam to a depth of about 25 inches. Below this, to a depth of about 46 inches, is a very firm, hard and brittle fragipan that is dominantly pale-brown silt loam in the upper part and light brownish-gray silty clay loam in the lower part. Below the fragipan is mottled yellowish-brown, gray, yellowish-red, and light olive-brown, firm clay.

Figure 12.—**Area of Bradyville-Rock outcrop complex, 0 to 2 percent slopes. Outcrops of rock interfere with tillage.**

Representative profile of Byler silt loam, 0 to 2 percent slopes:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; few small, black concretions; strongly acid; abrupt, smooth boundary.

B1—8 to 16 inches, brown (7.5YR 4/4) silt loam; common, fine, faint, yellowish-brown and brown mottles; weak, medium, subangular blocky structure; friable; common fine roots; common small, black concretions; strongly acid; clear, smooth boundary.

B2t—16 to 25 inches, yellowish-brown (10YR 5/4) silt loam; common, fine and medium, faint, brown and pale-brown mottles; moderate, medium, subangular blocky structure; friable; patchy clay films; common fine roots; common small and medium, black concretions; many peds coated with reddish-brown concretionary stains; strongly acid; clear, wavy boundary.

Bx1—25 to 34 inches, pale-brown (10YR 6/3) silt loam; common, fine and medium, distinct, light-gray (10YR 7/1), strong-brown (7.5YR 5/6), and yellowish-brown (10YR 5/6) mottles; about 80 percent of the cross-section is dense and brittle prisms, 2 to 8 inches across, separated by ¼- to 2-inch, tapering wedges of mottled gray, structureless silt loam; prisms break into weak, medium, subangular blocky peds; patchy clay films; few fine roots in wedges; common small and medium, black and reddish-brown concretions; strongly acid; gradual, smooth boundary.

Bx2—34 to 46 inches, light brownish-gray (10YR 6/2) silty clay loam; common, fine and medium, distinct, light olive-brown (2.5Y 5/6) and yellowish-brown (10YR 5/4) mottles and few, fine and medium, prominent, yellowish-red (5YR 5/6) mottles; moderate, coarse, prismatic structure forming prisms 2 to 8 inches across separated by tapering wedges of structureless silt loam; prisms break into weak subangular blocky structure; prisms are firm and brittle in about 80 percent of the cross-section; few fine roots in wedges; patchy clay films; common medium and large, black concretions; many black concretionary stains; strongly acid; clear, wavy boundary.

IIB2t—46 to 65 inches, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), yellowish-red (5YR 4/6), and light olive-brown (2.5Y 5/6) clay; weak, medium and coarse, angular blocky structure; firm; patchy clay films; many medium and large, black concretions; medium acid.

Depth to the fragipan ranges from 18 to 34 inches. The loamy mantle ranges from 3 to 6 feet in thickness. In places there is a thin cherty or gravelly layer just above the clayey layer. Depth to limestone bedrock ranges from 5 to 8 feet or more.

The A horizon is brown, dark grayish-brown, or dark yellowish-brown silt loam that ranges from 5 to 10 inches

in thickness. The B horizon above the fragipan is brown, yellowish-brown, dark yellowish-brown, or strong-brown, friable silt loam or silty clay loam.

ByA—Byler silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil has a fragipan at a depth of 18 to 34 inches. It formed in 3 to 6 feet of a loamy layer of loess or alluvium, or both, and in the underlying clay that weathered from limestone. It has the profile described as representative of the series. The surface layer is brown silt loam 5 to 10 inches thick. The subsoil above the fragipan is brown, strong-brown, or yellowish-brown, friable silt loam or silty clay loam. The fragipan is mottled, dense, brittle silt loam or silty clay loam. Mottled, firm clay extends from the base of the fragipan to limestone bedrock, which is at a depth of 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that have a subsoil of silty clay or clay and a few areas of well-drained soils that do not have a fragipan.

This soil is strongly acid to medium acid. The clay is commonly less acid than the overlying loamy material. The soil above the fragipan is easily penetrated by plant roots, water, and air, but the fragipan restricts the penetration of roots and slows the movement of water. Because drainage is slow through the fragipan, the soil is waterlogged during rainy periods.

This soil is very easy to work. It is well suited to shallow-rooted crops and most pasture plants. Most of the acreage has been cleared and is used mainly for crops and pasture. If the soil is well managed, it can be used intensively for crops. Capability unit IIw–1; woodland group 3o7.

ByB—Byler silt loam, 2 to 5 percent slopes. This gently sloping soil has a fragipan at a depth of 18 to 34 inches. It formed in a loamy layer of loess or alluvium, or both, and in the underlying clay that weathered from limestone. The surface layer is brown, friable silt loam 5 to 10 inches thick. The subsoil above the fragipan is brown, strong-brown, yellowish-brown, or brownish-yellow, friable silt loam or silty clay loam. The fragipan is mottled, dense, brittle silt loam or silty clay loam. Mottled, firm clay extends from the base of the fragipan to limestone bedrock, which is at a depth of about 5 to 8 feet. In places there is a thin cherty or gravelly layer just above the clay.

Included with this soil in mapping are a few small areas of moderately well drained soils that have a subsoil of silty clay or clay within 12 to 20 inches of the surface. Also included are a few small areas of well-drained soils that have a subsoil of silt loam or silty clay loam and do not have a fragipan.

This soil is strongly acid or medium acid throughout. The soil above the fragipan is easily penetrated by plant roots, water, and air, but the fragipan restricts the penetration of roots and slows the movement of water. During rainy periods the soil is waterlogged above the fragipan, and during dry periods the soil dries out and is somewhat droughty. Runoff is medium.

This soil is easy to work. It is well suited to shallow-rooted crops and most pasture plants. Deep-rooted legumes ordinarily last only 2 or 3 years. Most of the acreage has been cleared and is used mainly for pasture and crops. A few areas are idle. Response to management is good. Capability unit IIe–3; woodland group 3o7.

Cannon Series

The Cannon series consists of well-drained, deep loamy soils. These soils formed in recent deposits of cherty or gravelly river sediments. They are mostly along streams that head in highly dissected areas of the Highland Rim and the Outer Central Basin. In most places they are subject to occasional flooding. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark-brown cherty silt loam about 26 inches thick. The subsoil is brown, friable cherty silty clay loam about 16 inches thick. Below this is brown, cherty silty clay loam mottled with shades of gray and brown.

Representative profile of Cannon cherty silt loam:

Ap—0 to 12 inches, dark-brown (10YR 3/3) cherty silt loam; weak, fine, granular structure; very friable; many fine roots; about 25 percent, by volume, ¼- to 2-inch chert pebbles; slightly acid; clear, smooth boundary.

A12—12 to 18 inches, dark-brown (10YR 3/3) cherty silt loam; moderate, fine and medium, granular structure; friable; common fine roots; about 25 percent, by volume, ¼- to 3-inch chert pebbles; neutral; clear, smooth boundary.

A13—18 to 26 inches, dark-brown (10YR 3/3) cherty silt loam; weak, fine and medium, subangular blocky structure breaking to moderate, medium, granular; friable; few fine roots; common small fragments of black shale; about 30 percent, by volume, ¼- to 3-inch chert pebbles; neutral, gradual, wavy boundary.

B—26 to 42 inches, brown (10YR 4/3) cherty silty clay loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; common small fragments of black shale; about 30 percent, by volume, ¼- to 3-inch chert pebbles; neutral; gradual, smooth boundary.

C—42 to 50 inches, brown (10YR 4/3) cherty silty clay loam; many, medium, faint, dark grayish-brown (10YR 4/2) mottles and few, distinct, brown mottles; massive; firm; few small, black and brown concretions; about 20 percent, by volume, ¼- to 3-inch chert pebbles; neutral.

The soil ranges from 15 to 35 percent chert or gravel throughout. Depth to limestone bedrock ranges from 5 to 8 feet or more. Reaction ranges from medium acid to neutral throughout.

The A horizon is dark-brown cherty or gravelly silt loam 24 to 36 inches thick. The B horizon ranges from brown, dark yellowish-brown, or yellowish-brown cherty or gravelly silt loam to cherty or gravelly silty clay loam.

Ca—Cannon cherty silt loam. This deep, nearly level or gently sloping, well-drained loamy soil has chert or gravel on the surface and throughout the soil. It is in narrow strips along streams that head in highly dissected areas of the Highland Rim and the Outer Central Basin. It has a thick surface layer of dark-brown cherty or gravelly silt loam underlain by brown cherty or gravelly silt loam or silty clay loam. Depth to limestone bedrock ranges from 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are 40 to 60 inches deep to bedrock. Also included are some areas of soils that are clay between depths of 24 and 40 inches.

This soil is medium acid to neutral. In most places it is medium to high in content of phosphorus. In most places the soil is subject to occasional and very brief flooding. Permeability is moderately rapid. Because of the chert or gravel, available water capacity is only medium.

This soil is suited to all commonly grown crops and pasture plants. Crops can be grown every year, but the chert and gravel interfere somewhat with tillage of most row crops. About three-fourths of the acreage has been cleared and is used mainly for crops and pasture. Capability unit IIs–1; woodland group 2o7.

Capshaw Series

The Capshaw series consists of moderately well drained, deep soils. These soils formed in old alluvium or partly in a thin mantle of alluvium or loess and partly in the underlying clayey residuum weathered from limestone. They are on terraces, in slight depressions, and on broad, flat uplands. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is brown, friable silt loam about 7 inches thick. The upper 12 inches of the subsoil is yellowish-brown and strong-brown, friable silty clay loam; the lower 27 inches is light olive-brown and olive-brown, firm clay mottled with shades of brown, yellow, red, and gray. Below this is mottled grayish-brown, yellowish-brown, gray, and light olive-brown, very firm clay that extends to a depth of 60 inches or more.

Representative profile of Capshaw silt loam, 0 to 2 percent slopes:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; common small and medium, rounded, black concretions; strongly acid; clear, smooth boundary.

B21t—7 to 12 inches, yellowish-brown (10YR 5/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; common small, rounded, black concretions; strongly acid; gradual, smooth boundary.

B22t—12 to 19 inches, strong-brown (7.5YR 5/6) silty clay loam; few, fine and medium, faint, yellowish-brown (10YR 5/6) and light olive-brown (2.5Y 5/4) mottles; moderate, medium, subangular and angular blocky structure; friable; patchy clay films; few fine roots; common small and medium, rounded, black concretions; strongly acid; gradual, wavy boundary.

B23t—19 to 32 inches, light olive-brown (2.5Y 5/4) clay; many, fine and medium, distinct, red (2.5YR 4/6), yellowish-brown (10YR 5/6), and grayish-brown (2.5Y 5/2) mottles; moderate, medium, angular blocky structure; firm; continuous clay films; few fine roots; common small and medium, black concretions; strongly acid; gradual, wavy boundary.

B24t—32 to 46 inches, olive-brown (2.5Y 4/4) clay; many, medium, distinct, brownish-gray (2.5Y 5/2) and yellowish-brown (10 YR 5/4) mottles; weak, medium and coarse, angular blocky structure; very firm; patchy clay films; common small and medium, black and brown concretions; strongly acid; gradual, wavy boundary.

C—46 to 60 inches, mottled grayish-brown (2.5Y 5/2), yellowish-brown (10YR 5/6), gray (N 6/0), and light olive-brown (2.5Y 5/4) clay; massive; very firm; many medium and large, black concretions; medium acid.

Depth to limestone bedrock ranges from 4 to 8 feet. Reaction is commonly strongly acid to medium acid in the A and B horizons and medium acid to mildly alkaline in the C horizon.

The A horizon is brown, dark yellowish-brown, or dark grayish-brown silt loam 5 to 10 inches thick. The upper 10 to 20 inches of the B horizon is dominantly yellowish-brown or strong-brown silty clay loam or silty clay. Below this, it is clay mottled with various shades of gray, olive, yellow, brown, and red.

CpA—Capshaw silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on stream terraces, in slight depressions, and on broad, flat uplands. It has the profile described as representative of the series. It has a surface layer of brown silt loam and a clayey subsoil that is mottled in the lower part with shades of gray, yellow, and olive. Depth to limestone bedrock ranges from about 4 to 8 feet.

Included with this soil in mapping are areas of soils that have a very dark brown, very dark grayish-brown, or very dark gray surface layer 4 to 10 inches thick. Also included are a few small areas of soils that have a fragipan and a few areas of soils that are less than 48 inches deep to bedrock. Small areas of intermingled soils that have a few outcrops of rock are also included.

This soil is strongly acid or medium acid in the upper 2 or 3 feet and ranges from medium acid to mildly alkaline below. The slowly permeable, clayey subsoil limits the penetration of plant roots. The lower part of the subsoil is sometimes saturated by a fluctuating high water table or by seepage from higher adjacent uplands. Runoff and permeability are slow, and available water capacity is medium.

This soil is fairly easy to work, and crops can be grown every year. The soil is suited to most commonly grown crops and pasture plants. Deep-rooted legumes ordinarily last only 2 or 3 years. Most of the acreage has been cleared and is used mainly for crops and pasture. A large acreage of the pasture is unimproved, and several areas are idle. Capability unit IIw–1; woodland group 3o7.

CpB—Capshaw silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on stream terraces and uplands. It formed either in old alluvium or partly in a thin mantle of old alluvium or loess and partly in the underlying clayey residuum weathered from limestone. The surface layer is brown, friable silt loam 4 to 8 inches thick. The subsoil is dominantly yellowish-brown, strong-brown, or light olive-brown silty clay loam in the upper part and silty clay or clay mottled with gray in the lower part. Depth to limestone bedrock ranges from about 4 to 8 feet.

Included with this soil in mapping are small areas of soils that have a fragipan at a depth of about 2 feet. Also included are a few areas of soils that are less than 48 inches deep to bedrock and small areas of intermingled soils that have a few outcrops of rock.

This soil is commonly strongly acid to medium acid in the upper 2 or 3 feet and ranges from medium acid to mildly alkaline below. The slowly permeable subsoil limits the penetration of plant roots. The lower part of the subsoil is saturated for significant periods by seepage from higher adjacent uplands or by a fluctuating high water table. Runoff is medium to rapid, permeability is slow, and available water capacity is medium.

This soil is fairly easy to work. It is suited to most commonly grown crops and pasture plants. Deep-rooted legumes ordinarily last only 2 or 3 years. Response to management is good, but erosion is a hazard. Most of the acreage has been cleared and is used mainly for pasture and crops. Much of the pasture is unimproved, and several areas are idle. Capability unit IIe–3; woodland group 3o7.

Cumberland Series

The Cumberland series consists of well-drained, deep soils. These soils formed in about 3 to 6 feet of old alluvium and in the underlying clayey residuum weathered from limestone. In places the alluvium appears to be capped with a thin mantle of loess. These soils are on high stream terraces and uplands. Slopes range from 0 to 12 percent.

In a representative profile, the surface layer is dark reddish-brown, friable silt loam about 8 inches thick. The subsoil extends to a depth of 64 inches or more. The upper 6 inches is dark reddish-brown, friable silty clay loam; the next 34 inches is dark-red, firm clay; and the lower 16 inches is mottled red and strong-brown, very firm clay.

Representative profile of Cumberland silt loam, 2 to 5 percent slopes:

Ap—0 to 8 inches, dark reddish-brown (5YR 3/4) silt loam; moderate, medium, granular structure; friable; many fine roots; few fine, black and brown concretions; medium acid; abrupt, smooth boundary.

B21t—8 to 14 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, medium, subangular blocky structure; firm; patchy clay films; common fine roots; common fine, black and dark-brown concretions; medium acid; clear, smooth boundary.

B22t—14 to 27 inches, dark-red (2.5YR 3/6) clay; moderate, medium, subangular blocky structure; firm; continuous clay films; few fine roots; common fine, dark-colored concretions; strongly acid; diffuse, smooth boundary.

B23t—27 to 40 inches, dark-red (2.5YR 3/6) clay; moderate, medium and fine, subangular blocky structure; firm; continuous clay films; many fine, dark-colored concretions; strongly acid; gradual, smooth boundary.

B24t—40 to 48 inches, dark-red (2.5YR 3/6) clay; moderate, medium, angular and subangular blocky structure; firm; continuous clay films; many fine, dark-colored concretions; strongly acid; gradual, smooth boundary.

B25t—48 to 64 inches, mottled red (2.5YR 4/6) and strong-brown (7.5YR 5/6) clay; weak, coarse, angular blocky structure; very firm; continuous clay films; few fine chert fragments; strongly acid.

Depth to limestone bedrock is 5 to 8 feet or more. The old alluvium ranges from about 3 to 6 feet in thickness. In many places there are a few chert pebbles on the surface and throughout the alluvium, and in others there is a thin gravelly or cherty layer just above the contact between the alluvium and the clayey underlying residuum. Reaction ranges from medium acid to strongly acid throughout.

The A horizon ranges from 4 to 10 inches in thickness. It is dark-brown, dark reddish-brown, or dusky-red silt loam that ranges to silty clay loam and fine textured material in severely eroded areas. The B horizon is dark reddish-brown, dark-red, or dusky-red silty clay loam, silty clay, or clay.

CuA—Cumberland silt loam, 0 to 2 percent slopes. This deep, nearly level, well-drained soil is on stream terraces and uplands. The surface layer is dark-brown, dark reddish-brown, or dusky-red, friable silt loam 5 to 10 inches thick. The subsoil, to a depth of 36 to 72 inches, is dark reddish-brown, dark-red, or dusky-red, friable silty clay or clay. Below this, it is clay that formed in residuum weathered from limestone and it commonly has a yellower color than the overlying soil. Depth to limestone bedrock is 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are 40 to 60 inches deep to limestone bedrock. Also included are intermingled soils that have a few outcrops of rock.

This soil is medium acid to strongly acid. It has a deep root zone. Runoff is slow, permeability is moderate, and available water capacity is high.

This soil is easy to work. It is well suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared and is used mainly for pasture, row crops, and hay. A few areas are either in unimproved pasture or are idle. If the soil is well managed, it can be used intensively for row crops. Response to management is excellent. Capability unit I–2; woodland group 3o7.

CuB—Cumberland silt loam, 2 to 5 percent slopes. This deep, gently sloping, well-drained soil is on stream terraces and uplands. It has the profile described as representative of the series. The surface layer is dark reddish-brown silt loam 4 to 8 inches thick. The subsoil is firm, dark reddish-brown silty clay loam and dark-red clay. Limestone bedrock is at a depth of 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are 40 to 60 inches deep to bedrock and intermingled soils that have a few outcrops of limestone.

This soil is medium acid to strongly acid. It has a deep root zone. Runoff is medium, permeability is moderate, and available water capacity is medium to high.

This soil is easy to work. It is well suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared and is used for pasture, hay, and row crops. Much of the pasture is unimproved or is idle. Controlling erosion is the main concern of management. Response to management is excellent. Capability unit IIe–2; woodland group 3o7.

CuC2—Cumberland silt loam, 5 to 12 percent slopes, eroded. This deep, sloping, well-drained soil is on stream terraces and uplands. It formed in 3 to 6 feet of old alluvium and in the underlying clayey residuum weathered from limestone. The surface layer is dark-brown or dark reddish-brown, friable silt loam 4 to 8 inches thick. The subsoil, to a depth of 36 to 72 inches, is dark-red, dark reddish-brown, or dusky-red, friable silty clay or clay. Below this, it is clayey limestone residuum that commonly has a yellower color than the overlying alluvium. Depth to limestone bedrock is 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that have a subsoil of reddish-brown or yellowish-red silty clay loam. Also included are a few areas of soils that are less than 60 inches deep to bedrock and intermingled soils that have a few outcrops of limestone.

This soil is medium acid to strongly acid throughout. It has a deep root zone. Runoff is medium to rapid, permeability is moderate, and available water capacity is medium to high.

This soil is well suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared and is used for pasture, hay, and row crops. Much of the pasture is unimproved, and many areas are idle. The soil is highly susceptible to erosion, especially in areas where cultivated crops are grown. Capability unit IIIe–2; woodland group 3o7.

CvB3—Cumberland silty clay loam, 2 to 5 percent slopes, severely eroded. This deep, gently sloping, well-drained soil is on stream terraces and uplands. Rills and a few shallow gullies are common. This soil formed in old alluvium and in the underlying clayey residuum weathered from limestone. The thin plow layer of dark reddish-brown or dusky-red silty clay loam is mostly material from the subsoil. The subsoil, to a depth of 30 to 60 inches, is dark reddish-brown, dark-red, or dusky-red silty clay or clay. Below this, it is clay that formed in limestone and commonly has a yellower color than the overlying soil. Depth to limestone bedrock is 5 to 8 feet or more.

Included with this soil in mapping are a few areas of severely eroded soils that have a subsoil of reddish-brown or yellowish-red silty clay loam. Also included are a few areas of soils that are 40 to 60 inches deep to limestone bedrock and intermingled soils that have a few outcrops of rock.

This soil generally is in poor tilth. Clods form if it is worked when wet. The soil ranges from medium acid to strongly acid throughout. The part of the soil that formed in alluvium is easily penetrated by plant roots, water, and air, but the underlying clayey residuum is generally slowly permeable. Runoff is medium to rapid, and available water capacity is medium.

This soil is suited to most commonly grown crops and pasture plants. Because it is highly susceptible to erosion and has poor tilth, it is poorly suited to row crops that require frequent cultivation. It is better suited to small grain, hay, and pasture than to other crops. Most of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved. Many areas are used for row crops, and a few are idle. Capability unit IIIe–2; woodland group 4c3e.

CvC3—Cumberland silty clay loam, 5 to 12 percent slopes, severely eroded. This deep, sloping, well-drained soil is on stream terraces and uplands. Rills and a few shallow gullies are common. The soil formed in 30 to 72 inches of old alluvium and in the underlying clayey residuum weathered from limestone. The thin plow layer of dark reddish-brown or dusky-red silty clay loam or silty clay 2 to 5 inches thick consists mostly of material from the subsoil. The subsoil, to a depth of 30 to 72 inches, is dark-red, dark reddish-brown, or dusky-red silty clay or clay. Below this, it is clayey limestone residuum that commonly has a yellower color than the overlying alluvium. Depth to limestone bedrock is 5 to 8 feet or more.

Included with this soil in mapping are a few areas of severely eroded soils that have a subsoil of reddish-brown or yellowish-red silty clay loam. Also included are a few areas of soils that are less than 60 inches deep to bedrock, intermingled soils that have a few outcrops of limestone, and a few areas of soils that have 20 to 30 inches of old alluvium overlying the clayey limestone residuum.

This soil is generally in poor tilth. Clods form if it is worked when wet. It is medium acid to strongly acid throughout. Runoff is rapid, and available water capacity is medium to low.

This soil is suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared and is used mainly for pasture. A small acreage is used for row crops, and some is used for hay. Much of the pasture is unimproved, and many areas are idle. The soil is highly susceptible to erosion, especially in areas where cultivated crops are grown. Capability unit IVe–2; woodland group 4c3e.

Dellrose Series

The Dellrose series consists of well-drained, deep loamy soils. These soils formed in cherty creep or colluvium. They are on hillsides and toe slopes of highly dissected parts of the Highland Rim and the Outer Central Basin. Slopes range from 5 to 40 percent.

In a representative profile, the surface layer is dark-brown cherty silt loam about 9 inches thick. The subsoil extends to a depth of 63 inches or more. The upper 4 inches of the subsoil is brown, friable cherty silt loam; the next 23 inches is brown, friable cherty silty clay loam; and the lower 27 inches is strong-brown, friable cherty silty clay loam.

Representative profile of Dellrose cherty silt loam, 12 to 30 percent slopes:

Ap—0 to 9 inches, dark-brown (10YR 3/3) cherty silt loam; weak, fine, granular structure; very friable; many fine roots; few small, black concretions; about 15 percent, by volume, 1- to 3-inch angular chert fragments; strongly acid; abrupt, smooth boundary.

B1—9 to 13 inches, brown (7.5YR 4/4) cherty silt loam; weak, fine and medium, subangular blocky structure; friable; common fine roots; common small, black concretions; about 20 percent, by volume, 1- to 3-inch angular chert fragments; strongly acid; gradual, smooth boundary.

B21t—13 to 36 inches, brown (7.5YR 4/4) cherty silty clay loam; moderate, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; common small, black concretions; about 30 percent, by volume, 1- to 3-inch angular chert fragments; medium acid; gradual, wavy boundary.

B22t—36 to 53 inches, strong-brown (7.5YR 5/6) cherty silty clay loam; common, medium, distinct, yellowish-red (5YR 4/6) mottles; moderate, fine and medium, subangular and angular blocky structure; friable; continuous clay films; few fine roots; common fine and medium, black concretions; concretionary stains on many ped surfaces; about 35 percent, by volume, ¼- to 5-inch angular chert fragments; strongly acid; gradual, wavy boundary.

B23t—53 to 63 inches, strong-brown (7.5YR 5/6) cherty silty clay loam; common, fine, faint, yellowish-brown mottles; moderate, medium, angular and subangular blocky structure; friable; continuous clay films; common fine and medium, black concretions; concretionary stains on many ped surfaces; about 40 percent, by volume, ¼- to 4-inch angular chert fragments; strongly acid.

The cherty creep or colluvium ranges from 3 to 8 feet in thickness and commonly overlies yellowish clay that formed

in residuum weathered from phosphatic limestone. Depth to bedrock ranges from about 5 to 8 feet or more. The content of phosphorus is medium to high. Reaction is medium acid or strongly acid throughout the profile.

The A horizon ranges from 5 to 12 inches in thickness. The B horizon is brown, strong-brown, dark yellowish-brown, or yellowish-brown cherty silt loam or cherty silty clay loam. The A and B horizons range from 15 to 35 percent chert.

DeC—Dellrose cherty silt loam, 5 to 12 percent slopes. This deep, well-drained loamy soil is on toe slopes of highly dissected parts of the Highland Rim and the Outer Central Basin. It formed in cherty creep or colluvium. The surface layer is dark-brown cherty silt loam 4 to 12 inches thick. The subsoil is brown, strong-brown, yellowish-brown, or dark yellowish-brown, friable cherty silt loam and cherty silty clay loam. The cherty creep or colluvium is commonly underlain at a depth of 3 to 10 feet by yellowish clay that formed in material weathered from phosphatic limestone. Chert makes up 15 to 35 percent, by volume, of the material above the yellowish clay. Depth to limestone bedrock ranges from 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are 20 to 36 inches deep to yellowish, plastic clay and a few areas of soils that are less than 15 percent chert or gravel. Also included are a few areas of soils that are less than 60 inches deep to bedrock and small areas of intermingled soils that have a few outcrops of limestone.

Chert or gravel on the surface of this soil interferes somewhat with cultivation, but otherwise tilth is good. The soil is medium acid or strongly acid. It is medium to high in content of phosphorus. It has a deep root zone. Permeability is moderately rapid, and available water capacity is medium.

This soil is suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared and is used for pasture and row crops. Many areas used for pasture are unimproved, and a few areas are idle. Capability unit IIIe–1; woodland group 2o7.

DeE—Dellrose cherty silt loam, 12 to 30 percent slopes. This deep, well-drained loamy soil is on hillsides of the highly dissected parts of the Outer Central Basin. It formed in cherty creep or colluvium. It has the profile described as representative of the series. The surface layer is dark-brown cherty silt loam 5 to 12 inches thick. The subsoil is dominantly brown or strong-brown, friable cherty silt loam and cherty silty clay loam. In most areas yellowish, plastic clay that formed in material weathered from phosphatic limestone is under the cherty creep or colluvium. Limestone bedrock is at a depth of 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are 24 to 36 inches deep to yellowish, plastic clay. Also included are a few areas of soils that are 40 to 60 inches deep to bedrock and small inseparable areas of intermingled soils that have a few outcrops of limestone.

This soil is medium acid or strongly acid and medium to high in content of phosphorus. It has a deep root zone. Permeability is moderately rapid, and available water capacity is medium.

Under a high level of management, this soil is well suited to pasture. It is one of the best soils in the county for trees, especially poplar, walnut, and locust. About 75 percent of the acreage has been cleared. Most areas are pastured, but much of the pasture is unimproved. Many cleared areas are reverting to locust trees. Because the soil is steep and cherty, it is difficult to work with farm machinery. Capability unit VIe–1; woodland group 2r8.

DeF—Dellrose cherty silt loam, 30 to 40 percent slopes. This deep, steep, well-drained loamy soil is on hillsides in the Outer Central Basin. The surface layer is dark-brown cherty silt loam 5 to 10 inches thick. The subsoil, to a depth of 36 inches or more, is dominantly brown, strong-brown, or yellowish-brown, friable cherty silt loam or cherty silty clay loam. Depth to limestone bedrock ranges from 5 to 8 feet or more.

Included with this soil in mapping are a few areas of severely eroded soils that generally have a lighter brown, slightly finer textured surface layer than the less severely eroded soils. Also included are a few areas of soils that are 20 to 36 inches deep to yellowish, plastic clay; a few areas of soils that are less than 60 inches deep to limestone bedrock; and small areas of intermingled soils that have a few outcrops of limestone.

This soil is medium acid or strongly acid and medium to high in content of phosphorus. Permeability is moderately rapid, and available water capacity is medium.

This soil is well suited to trees, especially poplar, walnut, and locust. About half of the acreage was once cleared and used mainly for pasture. Many areas are still in pasture, but most pasture is unimproved. Some areas are idle and are rapidly reverting to trees. Pasture plants grow well, but they are difficult to establish and maintain because the soil is cherty and steep. Capability unit VIe–1; woodland group 2r8.

Dilton Series

The Dilton series consists of poorly drained, shallow soils. These soils formed in alluvium. These soils are on small flood plains and in upland depressions. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is about 12 inches thick. The upper 9 inches is very dark grayish-brown silty clay loam, and the lower 3 inches is very dark gray silty clay. Below this is dark grayish-brown clay mottled with black and light brownish gray. Limestone bedrock is at a depth of about 16 inches.

Representative profile of Dilton silty clay loam, in an area of Dilton-Rock outcrop complex:

A11—0 to 9 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, fine and medium, granular structure; friable; common fine roots; common fine, brown and dark reddish-brown concretions; neutral; clear, wavy boundary.

A12—9 to 12 inches, very dark gray (10YR 3/1) silty clay; few, fine and medium, faint, very dark grayish-brown mottles; moderate, fine and medium, subangular blocky structure; firm; common fine roots; many fine and medium, dark-brown and black concretions; few small limestone fragments; mildly alkaline; clear, wavy boundary.

Cg—12 to 16 inches, dark grayish-brown (2.5Y 4/2) clay; few, medium, distinct, black (10YR 2/1) and light

brownish-gray (2.5Y 6/2) mottles; massive; very firm; many fine and medium, brown and black concretions; common ¼- to 3-inch, weathered limestone fragments; mildly alkaline.

R—16 inches, limestone bedrock.

Depth to bedrock ranges from about 8 to 20 inches. Reaction ranges from slightly acid to mildly alkaline throughout the profile.

The A horizon is very dark brown, very dark grayish-brown, very dark gray, or black silty clay loam or silty clay that ranges from about 6 to 15 inches in thickness. The C horizon is grayish-brown, dark grayish-brown, gray, dark-gray, or olive-gray silty clay or clay. It is commonly mottled with shades of brown, yellow, or gray and ranges from 5 to 15 percent fragments of chert or weathered limestone.

Df—Dilton-Rock outcrop complex. This complex is on small flood plains and in upland depressions. It consists of nearly level, poorly drained soils that are less than 20 inches deep to limestone bedrock and that have many outcrops of rock. Outcrops of limestone cover 10 to 25 percent of the land surface.

Included with this complex in mapping are a few areas of shallow, moderately well drained, somewhat poorly drained, and poorly drained soils that have few or no outcrops of rock. Also included are a few areas of dark-colored, somewhat poorly drained and poorly drained soils that are more than 20 inches deep to limestone bedrock.

The Dilton soil in this complex is slightly acid to mildly alkaline throughout. In places it is medium to high in content of phosphorus. The complex is subject to occasional flooding and ponding, and the water table is commonly within 10 to 18 inches of the surface for long periods in winter and spring. Permeability is slow.

The shallow depth to bedrock and outcrops of limestone make tillage with machinery impractical on most of this complex. Permanent pasture of water-tolerant plants can be grown, but clipping is difficult. Only about 30 percent of the acreage has been cleared, most of which is idle or is in unimproved pasture. Capability unit VIs–1; woodland group 4x3.

Dowellton Series

The Dowellton series consists of poorly drained, deep soils on stream terraces and broad upland flats. These soils formed in old clayey alluvium or partly in old alluvium and partly in the underlying residuum weathered from limestone. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is about 11 inches thick. The upper 7 inches is dark-gray silt loam, and the lower 4 inches is light brownish-gray silt loam. The subsoil is light brownish-gray and grayish-brown, firm and very firm silty clay and clay that is mottled with various shades of brown and red and is about 23 inches thick. Below this is mottled gray and light olive-brown, very firm clay about 12 inches thick. Limestone bedrock is at a depth of about 46 inches.

Representative profile of Dowellton silt loam:

Ap—0 to 7 inches, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; very friable; many fine roots; few fine, rounded, black concretions; slightly acid; abrupt, smooth boundary.

A2—7 to 11 inches, light brownish-gray (10YR 6/2) silt loam; weak, fine, granular structure; friable; many fine roots; common fine and medium, rounded, dark-brown concretions; dark-brown concretionary stains on many ped surfaces and in old root channels; medium acid; clear, wavy boundary.

B21tg—11 to 20 inches, light brownish-gray (2.5Y 6/2) silty clay; common, fine and medium, distinct, yellowish-brown (10YR 5/6) and light olive-brown (2.5Y 5/4) mottles; weak, medium, subangular blocky structure parting to moderate, fine, angular blocky; firm; continuous clay films; common fine roots; many black and brown concretions; medium acid; clear, wavy boundary.

B22tg—20 to 29 inches, light brownish-gray (2.5Y 6/2) clay; common, fine and medium, prominent, red (2.5YR 4/3), yellowish-red (5YR 4/6), and yellowish-brown (10YR 5/4) mottles; strong, fine and medium, angular blocky structure; firm; continuous clay films; few fine roots; common brown and black concretions; strongly acid; gradual, smooth boundary.

B23tg—29 to 34 inches, grayish-brown (2.5Y 5/2) clay; common, fine and medium, prominent, yellowish-red (5YR 4/6) mottles and common, medium, distinct, yellowish-brown (10YR 5/6) and light olive-brown (2.5Y 5/4) mottles; weak, medium, angular blocky structure; very firm; continuous clay films; few fine roots; common brown and black concretions; strongly acid; gradual, wavy boundary.

Cg—34 to 46 inches, mottled gray (5Y 6/1 and 10YR 5/1) and light olive-brown (2.5Y 5/4) clay; massive; very firm; common brown and black concretions; mildly alkaline.

R—46 inches, limestone bedrock.

Depth to bedrock ranges from 40 to 60 inches. During prolonged dry periods, cracks ½ inch to 2 inches across commonly extend from the surface to a depth of 20 inches or more. Reaction ranges from strongly acid to neutral in the upper part of the solum and from strongly acid to mildly alkaline in the lower part of the solum and in the C horizon. The C horizon and the lower part of the B horizon are typically less acid than the A horizon and the upper part of the B horizon.

The A horizon ranges from 5 to 14 inches in thickness. In many places the A2 horizon is either absent or has been mixed with the Ap horizon. In some places the B horizon extends to bedrock.

Do—Dowellton silt loam. This nearly level, poorly drained soil is on stream terraces and broad, flat uplands and in depressions. It has a clayey subsoil. It formed in old clayey alluvium or partly in alluvium and partly in the underlying clayey residuum. In places the soil appears to be capped with a thin mantle of loess. Depth to limestone bedrock ranges from 40 to 60 inches.

Included with this soil in mapping are a few areas of soils that have a very dark brown, very dark gray, or very dark grayish-brown surface layer. Also included are a few areas of soils that are less than 40 inches or more than 60 inches deep to bedrock.

This soil ranges from strongly acid to mildly alkaline. Commonly, the layer just above bedrock is less acid than the overlying ones. The soil is wet in winter and spring and is droughty in summer. It cracks when dry. The plastic, clayey subsoil restricts the penetration of plant roots and the movement of water and air. Runoff and permeability are slow, and ponding is common.

This soil is suited to shallow-rooted crops that can be planted late in spring. It is also suited to pasture plants that can withstand wetness. About 70 percent of the acreage has been cleared and is used mainly for

pasture and crops, but many areas are idle. Removing excess water is the main concern of management. Drainage outlets are not available in many places. Where drainage is provided, the soil can be used intensively for crops and pasture. Capability unit IVw–1; woodland group 3w9.

Eagleville Series

The Eagleville series consists of somewhat poorly drained and poorly drained, moderately deep soils. These soils formed in clayey alluvium that is underlain by limestone bedrock. They are on flood plains and in depressions. Slopes range from 0 to 3 percent.

In a representative profile, the surface layer is about 18 inches thick. The upper 7 inches is very dark grayish-brown silty clay loam, the next 4 inches is very dark gray silty clay loam, and the lower 7 inches is black clay mottled with dark grayish brown. The subsoil is mottled, dark grayish-brown, firm clay about 14 inches thick. Below this is mottled dark-gray, gray, strong-brown, and olive-brown, very firm clay. Limestone bedrock is at a depth of about 35 inches.

Representative profile of Eagleville silty clay loam:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, fine and medium, granular structure; friable; many fine roots; few fine, black concretions; slightly acid; abrupt, smooth boundary.

A12—7 to 11 inches, very dark gray (10YR 3/1) silty clay loam; moderate, medium, granular structure; friable; common fine roots; few fine, black concretions; slightly acid; clear, smooth boundary.

A13—11 to 18 inches, black (10YR 2/1) clay; few, fine and medium, distinct, dark grayish-brown (2.5Y 4/2) mottles; moderate, medium, angular blocky structure; firm; common fine roots; common fine and medium, brown and black concretions; few small chert pebbles; neutral; clear, wavy boundary.

B2g—18 to 24 inches, dark grayish-brown (2.5Y 4/2) clay; common, fine and medium, distinct, very dark gray (10YR 3/1), light olive-brown (2.5Y 5/4) and gray (5Y 5/1) mottles; weak, medium, angular blocky structure; firm; few fine roots; few fine and medium, brown and black concretions; few small chert pebbles; mildly alkaline; clear, wavy boundary.

B3g—24 to 32 inches, dark grayish-brown (2.5Y 4/2) clay; many, fine and medium, gray (5Y 5/1), light olive-brown (2.5Y 5/4), and olive-gray (5Y 4/2) mottles; weak, medium, angular blocky structure; very firm; few fine roots; common fine and medium, brown concretions; few small chert pebbles; mildly alkaline; clear, smooth boundary.

Cg—32 to 35 inches, mottled dark-gray (5Y 4/1), olive-brown (2.5Y 4/4), strong-brown (7.5YR 5/6), and gray (10YR 5/1) clay; massive; very firm; common brown and black concretions; common ¼- to 2-inch chert fragments; mildly alkaline.

R—35 inches, limestone rock.

Depth to bedrock ranges from 20 to 40 inches. In places there are a few chert fragments or pebbles throughout the soil. Reaction ranges from medium acid to mildly alkaline throughout the profile.

The A horizon is very dark brown, very dark grayish brown, very dark gray, dark brown, or black and ranges from 10 to about 20 inches in thickness. The upper 4 to 12 inches of the A horizon is dominantly silty clay loam but ranges from silt loam to silty clay. The lower part of the A horizon ranges from silty clay loam to clay. The B horizon is dominantly grayish-brown, dark grayish-brown, dark-gray, olive-gray, or gray silty clay or clay. It has few to many mottles in various shades of yellow, brown, and gray. The C horizon is mottled, massive clay or silty clay that is similar in color to the lower part of the B horizon.

Ea—Eagleville silty clay loam. This nearly level or gently sloping, somewhat poorly drained or poorly drained soil is on flood plains and in depressions. It formed in clayey alluvium. The dark-colored surface layer ranges from 10 to 20 inches thick. The subsoil is mottled. grayish clay or silty clay. Limestone bedrock is at a depth of 20 to 40 inches.

Included with this soil in mapping are a few small areas of dark-colored, poorly drained soils that are more than 40 inches or less than 20 inches deep to bedrock. Also included are intermingled soils that have a few outcrops of limestone.

This soil is medium acid to mildly alkaline throughout. When the soil is wet, it is sticky and plastic; when dry, it is hard and cloddy. It is subject to occasional flooding or ponding, and the water table is within 1 foot to 2 feet of the surface during parts of winter and spring. Runoff and permeability are slow.

This soil is suited to shallow-rooted crops that can be planted late in spring and to pasture plants that can withstand wetness. About 70 percent of the acreage has been cleared and is used mainly for pasture and crops. Many areas of pasture are unimproved, and several are idle. Wetness and flooding are the main concerns of management. Capability unit IIIw–1; woodland group 2w9.

Egam Series

The Egam series consists of moderately well drained, deep soils. These soils formed in sediment washed from soils derived mainly from limestone. They are on flood plains and in depressions. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is about 31 inches thick. The upper 10 inches is dark-brown silt loam, the next 8 inches is very dark grayish-brown silty clay loam, and the lower 13 inches is very dark brown silty clay loam. The subsoil is dark grayish-brown, firm silty clay and clay that is mottled with various shades of gray, brown, and yellow and is about 13 inches thick. Below this is mottled, dark-gray, firm clay. Limestone bedrock is at a depth of 55 inches.

Representative profile of Egam silt loam:

Ap—0 to 10 inches, dark-brown (10YR 3/3) silt loam; moderate, fine, granular structure; friable; many fine roots; few fine, black concretions; slightly acid; clear, smooth boundary.

A12—10 to 18 inches, very dark grayish-brown (10YR 3/2) silty clay loam; few, fine, faint, brown mottles; moderate, fine and medium, granular structure; friable; common fine roots; few fine, brown and black concretions; slightly acid; gradual, smooth boundary.

A13—18 to 31 inches, very dark brown (10YR 2/2) silty clay loam; moderate, fine and medium, granular structure; firm; few fine roots; few fine and medium, black and brown concretions; slightly acid; gradual, smooth boundary.

B2—31 to 38 inches, dark grayish-brown (10YR 4/2) silty clay; common, fine and medium, faint, grayish-brown (2.5Y 5/2), very dark grayish-brown (10YR 3/2), and brown (7.5YR 4/4) mottles; moderate, medium, angular blocky structure; firm; common

fine and medium, brown and black concretions; slightly acid; gradual, smooth boundary.

B3—38 to 44 inches, dark grayish-brown (2.5Y 4/2) clay; many, medium, distinct, strong-brown (7.5YR 5/6) and dark-gray (10YR 4/1) mottles; weak, medium, angular blocky structure; very firm; many medium and large, black and brown concretions; neutral; gradual, smooth boundary.

Cg—44 to 55 inches, dark-gray (10YR 4/1) clay; many, fine and medium, distinct, olive-brown (2.5Y 4/4) and yellowish-brown (10YR 5/6) mottles; massive; very firm; many medium and large, black and brown concretions; neutral; abrupt, smooth boundary.

R—55 inches, limestone rock.

Depth to bedrock ranges from 40 inches to about 8 feet or more. In places the soil is medium to high in content of phosphorus, and in a few places there are a few chert fragments or pebbles on the surface and throughout the soil. Reaction ranges from medium acid to neutral in the A horizon and from slightly acid to neutral in the B and C horizons.

The A horizon ranges from 24 to 36 inches in thickness. It commonly grades from dark-brown silt loam in the upper part to very dark brown or very dark grayish-brown silty clay loam or silty clay in the lower part. In places the suface layer is very dark brown or very dark grayish-brown silty clay loam. The B and C horizons are silty clay loam, silty clay, or clay and are commonly mottled to varying degrees.

Eg—Egam silt loam. This nearly level, moderately well drained soil is on flood plains and in upland depressions. In a few places a few chert fragments or pebbles are on the surface and throughout the soil. Depth to limestone bedrock ranges from 40 inches to 8 feet or more.

Included with this soil in mapping are a few areas of soils that have a surface layer less than 24 inches thick and a few areas of soils that have 4 to 12 inches of brown, recently deposited sediments on the surface. Also included are a few areas of soils that are 20 to 40 inches deep to bedrock.

This soil is medium acid to neutral. In places it is medium to high in content of phosphorus. Most areas are subject to occasional flooding or to ponding. Runoff is slow, permeability is moderately slow, and available water capacity is high.

This soil is well suited to most commonly grown crops and pasture plants. About 90 percent of the acreage has been cleared. The soil is used mainly for crops and pasture, but many areas are idle. If the soil is well managed, it can be used intensively for crops. The hazard of flooding or ponding is the main concern of management. Capability unit IIw–2; woodland group 2o7.

Gladeville Series

The Gladeville series consists of well-drained, shallow flaggy soils. These soils formed in residuum derived from thin-bedded flaggy limestone. They are on rolling uplands in the Inner Central Basin. Slopes range from 2 to 15 percent.

In a representative profile, the surface layer is very dark grayish-brown flaggy silty clay loam about 7 inches thick. Below this is 3 inches of dark yellowish-brown flaggy clay. Hard, thin-bedded limestone is at a depth of 10 inches.

Representative profile of Gladeville flaggy silty clay loam, in an area of Gladeville-Rock outcrop-Talbott association, rolling:

A1—0 to 7 inches, very dark grayish-brown (10YR 3/2) flaggy silty clay loam; moderate, medium, granular structure; friable; many fine roots; few small, black concretions; about 50 percent flat fragments of limestone, 1 inch to 3 inches thick and 2 to 10 inches long, scattered over the surface and throughout the horizon; few nodules of calcium carbonate; mildly alkaline.

C—7 to 10 inches, dark yellowish-brown (10YR 4/4) flaggy clay; few, fine, faint, yellowish-brown (10YR 5/6) and brown (7.5YR 4/4) mottles; massive; firm; common fine roots; common small, dark-brown and black concretions; common nodules of calcium carbonate; about 60 percent flat fragments of limestone; moderately alkaline.

R—10 inches, hard, thin-bedded limestone and thin seams of clay.

Depth to bedrock ranges from about 3 to 12 inches. Fragments of limestone make up 35 to 65 percent of the soil. Reaction is neutral to moderately alkaline throughout.

In many places the A horizon extends to bedrock. The A horizon is very dark grayish brown, dark brown, or very dark gray. The C horizon is yellowish-brown, dark yellowish-brown, or brown silty clay or clay.

GRC—Gladeville-Rock outcrop-Talbott association, rolling. This association consists of "glady" land, outcrops of bouldery limestone, and clayey soils on gently rolling uplands. It is mostly in the Inner Central Basin, but a few areas are on ridgetops and mild slopes in the Outer Central Basin. It is about 40 percent Gladeville soils, 20 percent Rock outcrop, and 15 percent Talbott soils. The rest is Barfield, Bradyville, Dilton, and Eagleville soils.

The Gladeville soil in this association is on nearly bare rocky places, called "glades." The land surface is relatively smooth, and 3 to 12 inches of clayey material overlies thinly bedded limestone. Thin flags of limestone 2 to 10 inches long commonly are scattered over the surface and throughout the soil.

Rock outcrop in most places consists of bouldery limestone that extends 1 foot to 3 feet above strips of soil between the outcrops (fig. 13). The outcrops are widely spaced in a few places, but in others they cover as much as 90 percent of the land surface.

The Talbott soil in this association is generally in strips between the bouldery limestone outcrops. Where not severely eroded, it has a surface layer of brown silt loam and a subsoil of yellowish-red, plastic clay. Depth to limestone bedrock ranges from about 20 to 40 inches.

This mapping unit has low potential for farming and trees. Several areas near Percy Priest Lake are used for recreation and housing developments. Central sewage systems are essential for housing developments. The largest acreage is in low-grade woodland, mostly redcedar (fig. 14). Many of the wooded areas are grazed. Capability unit VIIs–1; woodland group 5x3.

Gullied Land

Gu—Gullied land. This miscellaneous land type consists of very severely eroded soils that are cut by a close network of moderately deep and deep gullies. Between the gullies are remnants of soils, mainly those of

Figure 13.—**Typical area of Rock outcrop. Talbott and Barfield soils occupy the crevices between outcrops of limestone.**

the Talbott, Bradyville, Mimosa, and Dellrose series. Limestone bedrock crops out in many places, and it is exposed in most of the deep gullies. Slopes range from about 5 to 40 percent.

The soil material is variable in color, but in most places it is clayey and strongly acid. Generally, the soil material on slopes of more than 15 percent is medium to high in content of phosphorus. Runoff is very rapid, permeability is generally slow, and available water capacity is low.

Most areas of these very severely eroded soils are either idle or have been reforested naturally to a sparse growth of low-quality trees. Most areas are better suited to trees than other uses, but a few areas of deeper soils that have mild slopes can be reclaimed and used for pasture. The cost of reclamation, however, is very high. Capability unit VIIs–1; woodland group 5c3e.

Hampshire Series

The Hampshire series consists of well-drained, deep soils. These soils formed in material weathered from interbedded phosphatic limestone and shale. They are on uplands in the Outer Central Basin. Slopes range from 2 to 20 percent.

In a representative profile, the surface layer is brown silt loam about 6 inches thick. The subsoil extends to a depth of 40 inches. The upper 8 inches is yellowish-brown, friable silty clay loam; the next 22 inches is strong-brown, firm silty clay; and the lower 4 inches is yellowish-brown, firm silty clay. Below this is thinly stratified sandy limestone and mottled, yellowish-brown, firm clay. Interbedded limestone and shale bedrock is at a depth of 55 inches.

Representative profile of Hampshire silt loam, 5 to 12 percent slopes, eroded:

Ap—0 to 6 inches, brown (10YR 4/3) silt loam; few, faint, yellowish-brown and dark-brown mottles; moderate, fine and medium, granular structure; friable; many fine roots; few fine, dark concretions; strongly acid; clear, smooth boundary.

B21t—6 to 14 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine and medium, subangular and angular blocky structure; friable; patchy clay films; common fine roots; few fine, black concretions; strongly acid; clear, wavy boundary.

B22t—14 to 21 inches, strong-brown (7.5YR 5/6) silty clay;

Figure 14.—**Typical landscape showing the vegetation on Gladeville flaggy silty clay loam.**

strong, fine and medium, angular blocky structure; firm; continuous clay films; common fine roots; few fine, black concretions; strongly acid; gradual, wavy boundary.

B23t—21 to 36 inches, strong-brown (7.5YR 5/6) silty clay; few, fine, distinct, pale-brown mottles; strong, fine and medium, angular blocky structure; firm; continuous clay films; common fine roots; few fine, black concretions; few small and medium fragments of weathered sandy limestone; strongly acid; gradual, wavy boundary.

B24t—36 to 40 inches, yellowish-brown (10YR 5/4) silty clay; many, medium, distinct, strong-brown (7.5YR 5/6) and pale-brown (10YR 6/3) mottles; moderate, medium, angular blocky structure; firm; patchy clay films; few fine roots; common weathered fragments of sandy limestone; strongly acid; clear, smooth boundary.

C—40 to 55 inches, stratified sandy limestone fragments separated by thin layers or seams of yellowish-brown (10YR 5/4) clay mottled with light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6); massive; firm; medium acid; abrupt, smooth boundary.

R—55 inches, interbedded phosphatic limestone and shale.

Depth to hard bedrock ranges from 40 to about 65 inches. In places there are a few weathered fragments of sandy limestone and shale on the surface and throughout the soil. Reaction ranges from medium acid to very strongly acid throughout, except that the layer just above bedrock ranges to slightly acid.

The A horizon ranges from 4 to about 9 inches in thickness. In places, especially wooded areas, the upper 3 to 5 inches is dark brown. The A horizon is dominantly silt loam, but in places it is loam and, where severely eroded, silty clay loam and finer textured material. The B horizon is dominantly brown, yellowish-brown, or strong-brown silty clay loam to clay. It is typically silty clay loam in the upper part and silty clay or clay in the lower part. Coarse fragments of sandy limestone range from a few to as much as 90 percent in the C horizon.

HaB—Hampshire silt loam, 2 to 5 percent slopes. This gently sloping, well-drained soil is on uplands of the Outer Central Basin. It formed in residuum weathered from interbedded phosphatic limestone and shale. The surface layer is brown silt loam 5 to 9 inches thick. The upper 5 to 10 inches of the subsoil is yellowish-brown, friable silty clay loam. Below this, the subsoil is dominantly brown, strong-brown, or yellowish-brown silty clay loam, silty clay, or clay that extends to a depth of 36 to 48 inches. The lower part of the subsoil and the underlying material are commonly mottled and contain varying amounts of coarse

sandy limestone fragments. Depth to hard bedrock ranges from about 40 to 65 inches.

Included with this soil in mapping are a few areas of severely eroded soils that have a surface layer of silty clay loam. Also included are a few areas of soils that have a surface layer of dark-brown silt loam or loam 6 to 8 inches thick and a subsoil of friable silty clay loam or clay loam that extends to a depth of 30 inches or more.

This soil is medium acid to very strongly acid, except for the layer just above bedrock. The soil is medium to high in content of phosphorus. Permeability is moderate, and available water capacity is medium.

If well managed, this soil is suited to most commonly grown crops and pasture plants. Most of the acreage has been cleared and is used mainly for crops and pasture. Many areas of pasture are unimproved or are idle. Controlling erosion is the main concern of management. Response to management is good. Capability unit IIIe–3; woodland group 3o7.

HaC2—Hampshire silt loam, 5 to 12 percent slopes, eroded. This sloping, well-drained soil is on uplands of the Outer Central Basin. It formed in interbedded phosphatic limestone and shale. It has the profile described as representative of the series. The surface layer is brown silt loam 4 to 9 inches thick. The upper part of the subsoil is yellowish brown, friable silty clay loam; the middle part and the lower part are strong-brown and yellowish-brown, firm silty clay or clay. Fragments of weathered, sandy limestone commonly increase in both size and amount with increasing depth. Depth to hard bedrock ranges from 40 to about 65 inches.

Included with this soil in mapping are a few small areas of soils that have a surface layer of dark-brown silt loam or loam 6 to 8 inches thick and a subsoil of friable silty clay loam or clay loam that extends to a depth of about 30 inches or more.

This soil is medium acid to very strongly acid, except for the layer just above bedrock. The soil is medium to high in content of phosphorus. Permeability is moderate, and available water capacity is medium.

This soil is suited to most commonly grown crops and pasture plants. Most of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and many areas are idle. If the soil is well managed, row crops can be grown occasionally. Capability unit IVe–3; woodland group 3o7.

HaD2—Hampshire silt loam, 12 to 20 percent slopes, eroded. This moderately steep, well-drained soil is on hillsides in the Outer Central Basin. It formed in material weathered from interbedded phosphatic limestone and shale. Commonly, a few fragments of sandy limestone are on the surface and throughout the soil. They generally increase in amount and size with increasing depth. The surface layer is brown silt loam 4 to 8 inches thick. The subsoil is dominantly yellowish-brown or strong-brown silty clay loam that grades to silty clay or clay in the lower part. Hard bedrock is at a depth of 40 to about 60 inches.

Included with this soil in mapping are small spots of severely eroded soils that have a surface layer of silty clay loam. Also included are small areas of clayey soils that are 15 to 30 percent coarse fragments.

This soil is medium acid to very strongly acid, except for the layer just above bedrock. The soil is medium to high in content of phosphorus. The clayey subsoil restricts the penetration of plant roots and the movement of water and air. Runoff is rapid, permeability is moderate, and available water capacity is medium.

Because of slope, the clayey subsoil, and rapid runoff, this soil is highly susceptible to erosion. It is better suited to permanent pasture and hay. Most of the acreage has been cleared and is used mainly for pasture. A few areas are used for row crops, and several areas are idle. Capability unit VIe–2; woodland group 3o7.

HbC3—Hampshire silty clay loam, 5 to 12 percent slopes, severely eroded. This sloping, well-drained soil is on uplands of the Outer Central Basin. Small rills and a few shallow gullies are common. In most places a few fragments of weathered sandy limestone, siltstone, and shale are on the surface and throughout the soil, generally increasing in amount and size with increasing depth. The thin surface layer is dark yellowish-brown silty clay loam that consists mostly of material from the subsoil. The subsoil is strong-brown or yellowish-brown silty clay or clay. Depth to hard, interbedded phosphatic limestone and shale bedrock ranges from 40 to about 60 inches.

Included with this soil in mapping are small areas of clayey soils that are 15 to 30 percent, by volume, coarse fragments.

This soil is medium acid to very strongly acid, except for the layer just above bedrock. The soil is medium to high in content of phosphorus. The clayey subsoil restricts the penetration of plant roots and the movement of air and water. Permeability is moderate, and available water capacity is medium to low.

Because yields of most crops are reduced by summer drought and because the hazard of further erosion is severe, this soil is poorly suited to cultivated crops. It is better suited to permanent pasture and hay than to other uses. Most of the acreage has been cleared and is used mainly for pasture or is idle. Capability unit VIe–2; woodland group 4c3e.

HbD3—Hampshire silty clay loam, 12 to 20 percent slopes, severely eroded. This moderately steep, well-drained soil is on uplands of the Outer Central Basin. Small rills and a few shallow gullies are common. In most places a few fragments of weathered sandy limestone, siltstone, and shale are on the surface and throughout the soil, generally increasing in size and amount with increasing depth. The thin surface layer is dark yellowish-brown silty clay loam that consists mostly of material from the subsoil. The subsoil is dominantly yellowish-brown or strong-brown silty clay or clay. Depth to bedrock ranges from 40 to about 60 inches.

Included with this soil in mapping are small areas of soils that are 15 to 30 percent coarse fragments.

This soil is medium acid to very strongly acid, except for the layer just above bedrock. The soil is medium to high in content of phosphorus. The clayey subsoil restricts the penetration of plant roots and the movement of water and air. Permeability is moderate, and available water capacity is medium to low.

Because this soil is highly susceptible to further ero-

sion and because yields of most crops are reduced by summer drought, the soil is better suited to permanent pasture and hay than to other uses. Most of the acreage has been cleared. Much of the soil is idle or is in unimproved pasture. Many areas have reverted to trees, mainly locust. Capability unit VIe–2; woodland group 4c3e.

Harpeth Series

The Harpeth series consists of well-drained, deep loamy soils. The upper 3 to 7 feet of these soils formed in sediment that appears to be a mixture of loess and old alluvium or loess underlain by old alluvium. This, in turn, is underlain by reddish or yellowish clay that formed in material weathered from limestone. These soils are on uplands and toe slopes and in broad upland depressions. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark-brown silt loam about 12 inches thick. The subsoil extends to a depth of 85 inches or more. It is brown, friable silt loam and silty clay loam to a depth of about 31 inches and reddish-brown and yellowish-red, friable silty clay loam to a depth of about 78 inches. Below this, it is yellowish-brown, firm clay mottled with yellowish red and light olive brown.

Representative profile of Harpeth silt loam, 0 to 2 percent slopes:

Ap—0 to 8 inches, dark-brown (7.5YR 3/2) silt loam; weak, fine, granular structure; very friable; many fine roots; few fine, black, rounded concretions; slightly acid; abrupt, smooth boundary.

A3—8 to 12 inches, dark-brown (7.5YR 4/2) silt loam; weak, fine, granular structure; very friable; common fine roots; common fine, black, rounded concretions; slightly acid; clear, wavy boundary.

B1—12 to 17 inches, brown (7.5YR 4/4) silt loam; weak, medium, subangular blocky structure; friable; common fine roots; common fine and medium, black and dark-brown concretions; medium acid; gradual, smooth boundary.

B21t—17 to 31 inches, brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable; patchy clay films; few fine roots; common fine, black concretions; medium acid; gradual, smooth boundary.

B22t—31 to 37 inches, reddish-brown (5YR 4/4) silty clay loam; moderate, medium, subangular and angular blocky structure; friable; continuous clay films; few fine roots; common fine, black, rounded concretions; strongly acid; gradual, smooth boundary.

B23t—37 to 48 inches, yellowish-red (5YR 4/6) silty clay loam; common, medium, distinct, dark-red (2.5YR 3/6) mottles; moderate, fine and medium, angular blocky structure; friable; continuous clay films; common fine and medium, black, rounded concretions; strongly acid; gradual, smooth boundary.

B24t—48 to 78 inches, yellowish-red (5YR 4/6) silty clay loam; common, fine and medium, distinct, brown (7.5YR 5/4), dark-red (2.5YR 3/6), and pale-brown (10YR 6/3) mottles; moderate, fine and medium, angular blocky structure; firm; continuous clay films; common fine and medium, black concretions; many peds coated with black concretionary stains; strongly acid.

IIB25t—78 to 85 inches, yellowish-brown (10YR 5/6) clay; few, fine, distinct, yellowish-red and light olive-brown mottles; weak, medium, angular blocky structure; firm; patchy clay films; few small, white, weathered fragments of chert; many fine and medium, black concretions; medium acid.

Depth to the clayey layer ranges from about 40 inches to 7 feet. In places there is a thin cherty or gravelly layer just above the clay. Depth to limestone bedrock ranges from about 5 to 8 feet or more. Reaction is medium acid or strongly acid except where limed.

The A horizon ranges from about 8 to 16 inches in thickness and is dark-brown or dark reddish-brown silt loam. The upper 20 to 40 inches of the B horizon is brown or reddish-brown, friable silt loam or silty clay loam. Below this, it is strong-brown, yellowish-red, red, or dark-red silty clay loam down to the clayey layer.

HcA—Harpeth silt loam, 0 to 2 percent slopes. This deep, nearly level, well-drained loamy soil is mostly in broad upland depressions in the Inner Central Basin. It is also on broad stream terraces and toe slopes. It has the profile described as representative of the series. The surface layer is dark-brown silt loam 8 to 16 inches thick. The upper part of the subsoil is brown, friable silt loam or silty clay loam; the lower part is generally redder and slightly finer textured than the upper part. Depth to limestone bedrock ranges from 5 to 8 feet or more.

Included with this soil in mapping are small areas of soils that have a dark-brown or dark reddish-brown surface layer 24 inches or more thick. Also included are a few areas of soils that are less than 60 inches deep to bedrock and intermingled soils that have a few outcrops of limestone.

This soil is medium acid to strongly acid. It has a deep root zone. Permeability is moderate, and available water capacity is high.

This soil is easy to work and is well suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared. The soil is used mainly for crops and pasture, but many areas are idle. The soil can be used intensively. Some areas in depressions are subject to ponding for very short periods after heavy rainfall. Capability unit I–1; woodland group 2o7.

HcB—Harpeth silt loam, 2 to 5 percent slopes. This deep, gently sloping, well-drained loamy soil is on toe slopes, fans, and stream terraces and in broad upland depressions. It has a surface layer of dark-brown silt loam 5 to 12 inches thick. The upper 15 to 36 inches of the subsoil is brown, reddish-brown, or dark yellowish-brown, friable silt loam and silty clay loam. Below this, the subsoil commonly is yellowish-red or red, friable silty clay loam. Depth to limestone bedrock ranges from about 5 to 8 feet or more.

Included with this soil in mapping are a few areas of soils that are less than 60 inches deep to bedrock and intermingled soils that have a few outcrops of limestone. Also included are a few areas of soils that have clay within 36 inches of the surface.

This soil is medium acid to strongly acid. It has a deep root zone and is easily penetrated by plant roots, water, and air. Runoff is medium, permeability is moderate, and available water capacity is high.

This soil is well suited to all commonly grown crops and pasture plants. It is easy to work, and response to management is excellent. Most of the acreage has been cleared and is used mainly for pasture and crops. Several areas are idle, and some of the pasture is unimproved. Controlling erosion is the main concern of management. Capability unit IIe–1; woodland group 2o7.

Hillwood Series

The Hillwood series consists of well-drained, deep gravelly soils. These soils formed in thick deposits of old gravelly alluvium and in the underlying material weathered from limestone. They are on high stream terraces, alluvial fans, and toe slopes, but mostly on high hills and knobs along the East Fork Stones River. Slopes range from 2 to 20 percent.

In a representative profile, the surface layer is dark reddish-brown gravelly silt loam about 5 inches thick. The subsoil extends to a depth of 70 inches or more. In sequence from the top, it is 22 inches of reddish-brown and yellowish-red gravelly silty clay loam, 35 inches of yellowish-red and red gravelly clay, and 8 inches of strong-brown clay mottled with red, pale brown, and reddish brown. Rounded chert pebbles make up about 50 to 70 percent of most of the subsoil above a depth of 62 inches (fig. 15).

Representative profile of Hillwood gravelly silt loam, 2 to 12 percent slopes:

Ap—0 to 5 inches, dark reddish-brown (5YR 3/4) gravelly silt loam; moderate, fine and medium, granular structure; very friable; many fine roots; few fine, black concretions; about 20 percent, by volume, ¼- to 2-inch rounded chert pebbles; strongly acid; clear, smooth boundary.

B1—5 to 9 inches, reddish-brown (5YR 4/4) gravelly silty clay loam; moderate, medium, subangular blocky structure; friable; common fine roots; few fine, black concretions; about 30 percent, by volume, ¼- to 2-inch rounded chert pebbles; strongly acid; gradual, smooth boundary.

B21t—9 to 27 inches, yellowish-red (5YR 4/6) gravelly silty clay loam; moderate, fine and medium, subangular and angular blocky structure; friable; thin continuous clay films; common fine roots; common fine, black concretions; about 50 percent, by volume, ¼- to 2-inch rounded chert pebbles; strongly acid; gradual, smooth boundary.

B22t—27 to 43 inches, yellowish-red (5YR 4/6) gravelly clay; moderate, fine and medium, angular blocky structure; friable; thick continuous clay films; few fine roots; common fine, black concretions; about 60 percent, by volume, ¼- to 3-inch rounded chert pebbles; strongly acid; gradual, smooth boundary.

B23t—43 to 62 inches, red (2.5YR 4/6) gravelly clay; few, fine and medium, faint, yellowish-red (5YR 4/6) and strong-brown (7.5 YR 5/6) mottles; weak, fine and medium, angular blocky structure; firm, continuous clay films; common fine, black concretions; about 70 percent, by volume, ¼- to 3-inch rounded chert pebbles; medium acid; clear, wavy boundary.

IIB24t—62 to 70 inches, strong-brown (7.5YR 5/6) clay; common, fine and medium, distinct, red (2.5YR 4/8), pale-brown (10YR 6/3), and reddish-brown (5YR 4/4) mottles; weak, medium and coarse, angular blocky structure; firm, plastic; patchy clay films; few fine, dark-colored concretions; few ¼- to 2-inch chert pebbles; slightly acid.

The gravelly alluvium ranges from about 40 inches to 8 feet in thickness. In most places clayey residuum underlies the alluvium and extends to limestone bedrock, which is at a depth of 5 to 8 feet or more. The content of gravel in the alluvium generally ranges from 35 to about 80 percent, but in the A and B1 horizons it is 15 to 35 percent. Reaction is strongly acid in the part that formed in alluvium and medium acid to slightly acid in the part that formed in clayey residuum.

The A horizon is dark reddish-brown, brown, dark-brown, or dark yellowish-brown gravelly silt loam that ranges from about 4 to 10 inches in thickness. The B1 horizon is reddish-brown, yellowish-red, brown, or strong-brown gravelly silty clay loam. The B2 horizon, which formed in alluvium, is yellowish-red, red, or reddish-brown gravelly silty clay loam, gravelly silty clay, or gravelly clay. The IIB horizon, which formed in material weathered from limestone, is strong-brown, yellowish-brown, or yellowish-red clay that is mottled with various shades of brown, yellow, and red.

Figure 15.—**Profile of Hillwood gravelly silt loam, 2 to 12 percent slopes. Water-rounded chert pebbles make up as much as 70 percent of the subsoil.**

HgC—Hillwood gravelly silt loam, 2 to 12 percent slopes. This well-drained gravelly soil is on high stream terraces, alluvial fans, and toe slopes. It formed in a thick deposit of old gravelly alluvium and in the underlying plastic clay, which formed in material weathered from limestone. The soil has the profile described as representative of the series. The surface layer is dark reddish-brown, dark-brown, brown, or dark yellowish-brown gravelly silt loam 4 to 10 inches thick. The part of the subsoil that formed in old alluvium is yellowish-red, reddish-brown, or red gravelly silty clay loam, gravelly silty clay, or gravelly clay. It is 35 to 80 percent rounded chert pebbles. Depth to limestone bedrock ranges from 5 to about 8 feet or more.

Included with this soil in mapping are a few areas of severely eroded soils that commonly have a surface layer of brown or reddish-brown gravelly silty clay loam 3 to 5 inches thick. Also included are a few areas of soils that are less than 60 inches deep to bedrock

and intermingled soils that have a few outcrops of limestone.

This soil commonly is strongly acid in the upper part and medium acid or slightly acid in the lower part. It has a deep root zone. Runoff is medium, permeability is moderately rapid, and available water capacity is low to medium.

This soil is poorly suited to row crops that are grown in summer because the high content of gravel limits available water capacity and interferes with cultivation of most crops. It is better suited to small grain, pasture, and hay than to other uses. About 75 percent of the acreage has been cleared and is used mainly for pasture. Capability unit IVs–1; woodland group 3f8.

HgD—Hillwood gravelly silt loam, 12 to 20 percent slopes. This deep, well-drained gravelly soil is mostly on high hills and knobs along the East Fork Stones River. It formed in old gravelly alluvium and in the underlying clay, which formed in material weathered from limestone. The surface layer is dark reddish-brown, dark-brown, or brown gravelly silt loam 4 to 8 inches thick. The part of the subsoil that formed in old alluvium is dominantly reddish-brown or yellowish-red gravelly silty clay loam or gravelly silty clay in the upper part and yellowish-red or red gravelly clay or gravelly silty clay in the lower part. Below this, between depths of 40 inches and 8 feet, it is mottled, yellowish-brown or strong-brown, plastic clay. Depth to limestone bedrock ranges from 5 to 8 feet or more.

Included with this soil in mapping are a few areas of severely eroded soils that have a thin surface layer of gravelly silty clay loam. Also included are a few areas of soils that are less than 60 inches deep to bedrock and small areas of intermingled soils that have a few outcrops of limestone.

This soil is commonly strongly acid in the gravelly layers and slightly acid or medium acid in the underlying clay. It has a deep root zone. Runoff is medium, permeability is moderately rapid, and available water capacity is low.

Slope and gravel make this soil very poorly suited to cultivated crops. The high content of gravel in the soil limits the supply of water available to plants, especially during summer. The soil is better suited to permanent pasture and hay than to other uses. About 65 percent of the acreage has been cleared and is used mainly for pasture. A few areas are idle, and some of the pasture is unimproved. Capability unit VIs–1; woodland group 3f8.

Inman Series

The Inman series consists of well-drained, moderately deep flaggy soils. These soils formed in residuum weathered from interbedded phosphatic limestone and shale. They are on ridgetops and hillsides in the Outer Central Basin. Flagstones are scattered over the surface and throughout the soil. Slopes range from 5 to 30 percent.

In a representative profile, the surface layer is dark grayish-brown flaggy silt loam about 8 inches thick. The subsoil is about 9 inches thick. The upper 4 inches is light olive-brown flaggy silty clay, and the lower 5 inches is mottled light olive-brown and grayish-brown clay and thin slabs of soft limestone. Below this is light olive-brown clay stratified with weathered limestone. Hard, interbedded limestone and shale is at a depth of 30 inches.

Representative profile of Inman flaggy silt loam, 5 to 12 percent slopes:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) flaggy silt loam; common, fine, faint, very dark grayish-brown mottles; moderate, fine and medium, granular structure; friable; many fine roots; few fine, black concretions; about 15 percent, by volume, fragments of weathered limestone, ½ inch to 2 inches thick and 6 to 8 inches long; slightly acid; clear, smooth boundary.

B2—8 to 12 inches, light olive-brown (2.5Y 5/4) flaggy silty clay; few, fine, faint, olive mottles; moderate, medium, subangular blocky structure; firm; few thin, patchy clay films; common fine roots; few fine, black concretions; about 20 percent, by volume, fragments of weathered limestone, ½ inch to 3 inches thick and 6 to 10 inches long; neutral; clear, smooth boundary.

B3—12 to 17 inches, alternating layers of mottled light olive-brown (2.5Y 5/4) and grayish-brown (2.5Y 5/2) clay and soft, weathered limestone; weak, medium, angular blocky structure; firm; about 25 percent, by volume, fragments of weathered limestone, ½ inch to 3 inches thick and 6 to 10 inches long; neutral; clear, wavy boundary.

C—17 to 30 inches, light olive-brown (2.5Y 5/4) clay stratified with 3- to 12-inch layers of weathered limestone; massive; very firm; about 35 percent, by volume, coarse fragments; mildly alkaline; abrupt, wavy boundary.

R—30 inches, hard, interbedded, phosphatic limestone and shale.

Depth to hard bedrock ranges from 20 to 40 inches. Coarse fragments commonly increase in both size and amount with increasing depth. They range from about 15 percent in the A horizon to as much as 50 percent in the lower part of the C horizon, just above the bedrock. The soil is medium to high in content of phosphorus. Reaction ranges from strongly acid to neutral in the upper part of the solum and from medium acid to mildly alkaline in the lower part of the solum and in the C horizon.

The A horizon ranges from about 5 to 9 inches in thickness. In most places it is brown or dark grayish brown, but in places the upper 2 to 5 inches is dark brown or very dark grayish brown. The B horizon is light olive brown, yellowish brown, or brown and generally is less than 12 inches thick. The C horizon is dominantly light olive brown, light yellowish brown, or brown. In many places the C horizon and lower part of the B horizon are mottled with olive and gray.

ImC—Inman flaggy silt loam, 5 to 12 percent slopes. This sloping, well-drained flaggy soil is on uplands of the Outer Central Basin. It formed in residuum weathered from interbedded phosphatic limestone and shale. It has the profile described as representative of the series. The surface layer is dark grayish-brown or brown flaggy silt loam, and the subsoil is light olive-brown, yellowish-brown, or brown flaggy clay or flaggy silty clay. Hard bedrock is at a depth of 20 to 40 inches.

Included with this soil in mapping are a few areas of soils that have slopes of 2 to 5 percent. Also included are a few areas of soils that are 40 to 60 inches deep to bedrock.

This soil is strongly acid to neutral in the upper part

and medium acid to moderately alkaline in the lower part. It is medium to high in content of phosphorus. Permeability is moderately slow, and available water capacity is low.

This soil is suited to pasture but only moderately well suited to most crops. It is susceptible to erosion, and coarse fragments on the surface and throughout the soil interfere with tillage. About 70 percent of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and many areas are idle. Capability unit IVe–3; woodland group 3f8.

InE—Inman flaggy silty clay loam, 12 to 30 percent slopes. This moderately steep and steep, well-drained flaggy soil is on uplands of the Outer Central Basin. Rills, shallow gullies, and a few deep gullies are in a few of the areas. The soil formed in residuum weathered from interbedded phosphatic limestone and shale. Coarse fragments of weathered limestone are on the surface and throughout the soil. The surface layer is dark grayish-brown, yellowish-brown, or brown flaggy silty clay loam 5 to 8 inches thick. The subsoil, 6 to 10 inches thick, is light olive-brown, light yellowish-brown, or brown flaggy clay or silty clay. Below this is light yellowish-brown or brown clay that is commonly mottled with olive and gray and is stratified with weathered limestone. Hard, interbedded limestone and shale is between depths of 20 and 40 inches.

Included with this soil in mapping are a few areas of soils that are 40 to 60 inches deep to hard bedrock. Also included are a few areas of soils that have few or no coarse fragments on the surface and in the upper 8 to 15 inches.

This soil generally is strongly acid to neutral in the upper part and medium acid to mildly alkaline in the lower part. The soil is medium to high in content of phosphorus. The clayey subsoil restricts the penetration of plant roots and the movement of water and air. Runoff is rapid, permeability is moderately slow, and available water capacity is low.

Because of slope, the clayey subsoil, and rapid runoff, this soil is susceptible to erosion. Coarse fragments interfere with tillage, and severely eroded areas are generally in poor tilth. The soil is better suited to permanent pasture and trees than to cultivated crops. About three-fourths of the acreage has been cleared. Most of the severely eroded soils were once cleared. Many areas are idle, and many are reverting back to trees, mainly locust. There are a few areas of improved pasture, but most pasture is unimproved. Capability unit VIe–2; woodland group 4c3e.

Lomond Series

The Lomond series consists of well-drained, deep loamy soils. These soils formed in thick deposits of old alluvium or in a mixture of loess and old alluvium and in the underlying clay, which formed in material weathered from limestone. They are on uplands in the Inner Central Basin. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark reddish-brown silt loam about 9 inches thick. The upper 40 inches of the subsoil is yellowish-red, red, and dark-red, friable silty clay loam that grades to yellowish-red, firm silty clay in the next 10 inches. Below this to a depth of 70 inches, the subsoil is strong-brown, firm clay.

Representative profile of Lomond silt loam, 2 to 5 percent slopes:

Ap—0 to 6 inches, dark reddish-brown (5YR 3/3) silt loam; weak, fine and medium, granular structure; friable; many fine roots; few fine, dark-colored concretions; medium acid; clear, smooth boundary.

A3—6 to 9 inches, dark reddish-brown (5YR 3/4) silt loam; moderate, fine and medium, granular structure; friable; many fine roots; few fine, dark-colored concretions; strongly acid; clear, smooth boundary.

B21t—9 to 20 inches, yellowish-red (5YR 4/6) silty clay loam; few, fine, faint, reddish-brown mottles; moderate, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; few fine, dark-colored concretions; strongly acid; clear, smooth boundary.

B21t—20 to 36 inches, dark-red (2.5YR 3/6) silty clay loam; moderate, medium, subangular blocky structure; friable; thick patchy clay films; few fine roots; common fine, dark-colored concretions; strongly acid; clear, smooth boundary.

B22t—36 to 42 inches, red (2.5YR 4/8) silty clay loam; moderate, medium, subangular blocky structure; friable; continuous clay films; few fine roots; common fine and medium, dark-colored concretions; few small chert pebbles; strongly acid; clear, smooth boundary.

B23t—42 to 49 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, fine and medium, angular blocky structure; friable; continuous clay films; common fine, dark-colored concretions; strongly acid; gradual, smooth boundary.

B24t—49 to 59 inches, yellowish-red (5YR 4/6) silty clay; common, fine and medium, distinct, strong-brown (7.5YR 5/6), brown (7.5YR 4/4), and dark-red (2.5YR 3/6) mottles; moderate, medium, angular blocky structure; firm; continuous clay films; common fine, dark-colored concretions; few small chert pebbles; strongly acid; gradual, smooth boundary.

IIB25t—59 to 70 inches, strong-brown (7.5YR 5/6) clay; few, fine and medium, distinct, yellowish-red (5YR 4/6) mottles; weak, medium, angular blocky structure; firm and plastic; patchy clay films; common fine, dark-colored concretions; few fragments of chert, less than 1 inch across; medium acid.

Depth to limestone bedrock ranges from 5 to about 8 feet. In many places the upper 10 to 20 inches of the soil appears to be mixed loess and old alluvium. Reaction is strongly acid in the upper part of the profile and ranges from strongly acid to slightly acid in the lower part.

The A horizon is dark reddish brown or dark brown and ranges from 5 to 10 inches in thickness. The upper part of the B horizon is dominantly yellowish-red silty clay loam, but in many places the middle and lower parts are dark-red silty clay loam, silty clay, or clay. The IIB horizon is plastic clay that is commonly yellower and has a higher content of clay than the overlying layers. It ranges from yellowish red, strong brown, and yellowish brown to light olive brown and commonly is mottled with various shades of brown, yellow, red, and gray with increasing depth. In places there is a thin cherty or gravelly layer just above the contact between the alluvium and the residuum.

LoA—Lomond silt loam, 0 to 2 percent slopes. This deep, nearly level, well-drained loamy soil is on uplands in the Inner Central Basin. It formed in 25 to 72 inches of old alluvium or mixed loess and alluvium and in the underlying clay, which formed in material weathered from limestone. The surface layer is dark reddish-brown or dark-brown silt loam 5 to 10 inches thick. The subsoil is dominantly yellowish-red, friable

silty clay loam that gradually becomes finer textured with increasing depth. At a depth of 40 to 50 inches or more, it is yellowish or reddish, firm clay mottled with shades of yellow, red, brown, olive, and gray. In places a thin cherty or gravelly layer is at the base of the alluvium. Depth to limestone bedrock ranges from about 5 to 8 feet.

Included with this soil in mapping are a few areas of soils that are less than 60 inches deep to bedrock and a few areas of soils that have a subsoil of silty clay or clay within 20 inches of the surface. Also included are a few intermingled soils that have a few outcrops of limestone.

This soil commonly is strongly acid in the upper part and strongly acid to slightly acid in the lower part. It has a deep root zone. Runoff is slow, permeability is moderate, and available water capacity is high.

This soil is well suited to all commonly grown crops and pasture plants. It is easy to work. If well managed, it can be used intensively for crops. Most of the acreage has been cleared. It is used mainly for crops and pasture, but a fairly large acreage is idle. Capability unit I–1; woodland group 2o7.

LoB—Lomond silt loam, 2 to 5 percent slopes. This deep, gently sloping, well-drained loamy soil is on uplands in the Inner Central Basin. It formed in 25 to 72 inches of old alluvium or mixed loess and alluvium and in the underlying clay, which formed in material weathered from limestone. It has the profile described as representative of the series. The surface layer is dark reddish-brown or dark-brown silt loam 5 to 10 inches thick. The subsoil is dominantly yellowish-red and red, friable silty clay loam to a depth of 40 to 50 inches or more. Below this, it is mottled, yellow, brown, and red, firm, plastic clay. Depth to limestone bedrock ranges from 5 to about 8 feet.

Included with this soil in mapping are a few areas of soils that are less than 60 inches deep to bedrock. Also included are a few areas of soils that have a subsoil of silty clay or clay within 20 inches of the surface and a few intermingled soils that have a few outcrops of limestone.

This soil commonly is strongly acid in the upper part and strongly acid to slightly acid in the lower part. It has a deep root zone. Runoff is medium, permeability is moderate, and available water capacity is high.

This soil is well suited to all commonly grown crops and pasture plants. Most of the acreage has been cleared. It is used mainly for crops and pasture, but a large acreage is idle and many areas of pasture are unimproved. Response to management is excellent. Capability unit IIe–1; woodland group 2o7.

Lynnville Series

The Lynnville series consists of moderately well drained, deep soils. These soils formed in sediment recently washed from soils derived mainly from limestone. They are on flood plains and in upland depressions and sinks. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is dark-brown silt loam about 13 inches thick. The upper 21 inches of the underlying material is mottled yellowish-brown, grayish-brown, dark-brown, and brown, friable silt loam. Below this, it is gray, firm silty clay loam mottled with shades of brown and olive. Limestone bedrock is at a depth of 45 inches.

Representative profile of Lynnville silt loam:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; many fine roots; few small, black concretions; neutral; clear, smooth boundary.

A12—8 to 13 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; common fine roots; common small and medium black concretions; few ¼- to 1-inch chert pebbles; neutral; gradual, wavy boundary.

C1—13 to 17 inches, brown (10YR 4/3) silt loam; common, fine and medium, distinct, yellowish-brown (10YR 5/4), grayish-brown (10YR 5/2), and strong-brown (7.5YR 5/6) mottles; weak, fine and medium, granular structure; friable; common fine roots; few small, soft, black and brown concretions; slightly acid; gradual, wavy boundary.

C2—17 to 34 inches, mottled yellowish-brown (10YR 5/6), grayish-brown (10YR 5/2), dark-brown (10YR 3/3), and brown (7.5YR 4/4) silt loam; weak, fine and medium, granular structure; friable; few fine roots; many medium and large, black and brown concretions; few small chert pebbles; slightly acid; gradual, wavy boundary.

C3g—34 to 45 inches, gray (N 6/0) silty clay loam; many, medium and coarse, prominent, brown (7.5YR 4/4), strong-brown (7.5YR 5/6), and light olive-brown (2.5Y 5/4) mottles; massive; firm; many medium and large, black and brown concretions; common small chert pebbles; few ½- to 3-inch fragments of weathered, sandy limestone; medium acid; abrupt, smooth boundary.

R—45 inches, limestone bedrock.

Depth to limestone bedrock ranges from about 40 inches to 8 feet. In places the soil is as much as 10 percent chert. In places it is medium to high in content of phosphorus. Reaction ranges from medium acid to neutral in the upper part of the profile and from medium acid to mildly alkaline in the lower part.

The A horizon ranges from 10 to 20 inches in thickness. It is dark brown or very dark grayish brown. The upper 10 to 24 inches of the C horizon is dominantly brown or yellowish brown and has few to many brown and gray mottles. The lower part of the C horizon is mottled in shades of gray, brown, yellow, and olive.

Ly—Lynnville silt loam. This deep, nearly level, moderately well drained loamy soil is on first bottoms and in upland depressions and sinks. It formed in sediment washed from soils on uplands. The surface layer is dark-brown silt loam 10 to 20 inches thick. Below this, the soil is dominantly brown or yellowish-brown, friable silt loam mottled with various shades of gray. In many areas the alluvium is underlain by 1 foot to 3 feet of highly mottled clay that formed in material weathered from limestone. Limestone bedrock is at a depth of 40 inches to 8 feet.

Included with this soil in mapping are a few areas of moderately well drained soils that formed in recently deposited sediment that is 15 to 25 percent chert. Also included are a few areas of soils that have a brown or dark grayish-brown surface layer and a few areas of soils that have a dark-brown surface layer less than 10 inches thick.

This soil is generally in good tilth. Fertility is high. The soil is medium acid to neutral in the upper part and medium acid to mildly alkaline in the lower part.

In many areas it is medium to high in content of phosphorus. A high water table generally keeps the soil saturated for short periods in winter and spring. Runoff is slow, and most areas are subject to flooding or ponding for short periods. Available water capacity is high.

This soil is well suited to most commonly grown crops and pasture. It can be used intensively. Crops may be damaged in many areas by flooding or ponding. Most of the acreage has been cleared and is used mainly for crops and pasture. Response to management is good. Capability unit IIw–2; woodland group 2w8.

Melvin Series

The Melvin series consists of poorly drained, deep soils. These soils formed in sediment recently washed from soils derived mainly from limestone. They are on flood plains and in upland depressions and sinks. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is grayish-brown silt loam about 12 inches thick. The subsoil is gray, friable silt loam that is mottled with dark grayish brown and is about 15 inches thick. Below this, to a depth of about 53 inches, is gray, firm silty clay loam mottled with dark gray.

Representative profile of Melvin silt loam:

Ap—0 to 12 inches, grayish-brown (10YR 5/2) silt loam; few, fine, faint, gray mottles; weak, fine, granular structure; friable; many fine roots; few fine, dark-colored concretions; medium acid; clear, smooth boundary.

Bg—12 to 27 inches, gray (10YR 5/1) silt loam; common, fine and medium, distinct, grayish-brown (2.5Y 4/2) mottles; weak, fine, granular structure; friable; few fine roots; few chert pebbles; common fine and medium, dark-colored concretions; medium acid; gradual, smooth boundary.

Cg—27 to 53 inches, gray (10YR 5/1) silty clay loam; common, medium and coarse, faint, dark-gray (N 4/0) mottles; massive; firm; many medium and large, dark-colored concretions; common small and medium chert pebbles; slightly acid.

The alluvium ranges from about 2 to 6 feet in thickness. In places it is underlain by mottled clay that weathered from limestone. Depth to limestone bedrock ranges from 40 inches to about 8 feet. The soil ranges from low to high in content of phosphorus. Reaction ranges from medium acid to neutral in the solum and from slightly acid to mildly alkaline in the C horizon.

The A horizon is brown, dark grayish brown, or grayish brown. It ranges from about 5 to 15 inches in thickness. The B and C horizons are dominantly gray with few to many mottles in shades of brown, yellow, and olive.

Me—Melvin silt loam. This nearly level, poorly drained soil is on first bottoms and in upland depressions. It formed in sediment washed from soils on the uplands. The surface layer is brown, dark grayish-brown, or grayish-brown silt loam 5 to 15 inches thick. The subsoil is gray, friable silt loam or silty clay loam. Limestone bedrock is at a depth of 40 inches to 8 feet.

Included with this soil in mapping are a few areas of soils that are less than 40 inches deep to bedrock. Also included are a few areas of soils that have a dark-brown or very dark grayish-brown surface layer.

This soil is medium acid to neutral in the surface layer and subsoil and slightly acid to mildly alkaline below. It ranges from low to high in content of phosphorus. A high water table keeps the soil saturated for long periods. Runoff is slow, and most areas are subject to flooding or ponding.

This soil is generally too wet to work until early in summer. Unless drainage is provided, it is poorly suited to most crops and is better suited to water-tolerant pasture than to other uses. Drained areas can be used intensively for crops. About half of the acreage has been cleared and is used mainly for pasture. Capability unit IIIw–1; woodland group 2w9.

Mimosa Series

The Mimosa series consists of well-drained, deep soils. These soils formed in residuum weathered from phosphatic limestone. They are on uplands that extend from the Highland Rim into the Outer Central Basin and on high knobs and hills within the Inner Central Basin. Slopes range from 5 to 40 percent.

In a representative profile, the surface layer is dark-brown cherty silt loam about 6 inches thick. The subsoil is firm or very firm clay. It is brown and strong brown in the upper 16 inches, yellowish brown in the middle 18 inches. and mottled with shades of brown, yellow, olive, and gray in the lower 15 inches. Phosphatic limestone bedrock is at a depth of 55 inches.

Representative profile of Mimosa cherty silt loam, in an area of Mimosa soils, 20 to 30 percent slopes:

Ap—0 to 6 inches, dark brown (10YR 3/3) and some brown (7.5YR 4/4) cherty silt loam; moderate, fine, granular structure; very friable; common fine roots; few fine, dark-colored concretions; about 15 percent, by volume, ½- to 3-inch angular chert fragments; medium acid; clear, smooth boundary.

B21t—6 to 12 inches, brown (7.5YR 4/4) silty clay; moderate, medium, angular and subangular blocky structure; firm; continuous clay films; common fine roots; few fine, dark-colored concretions; few ¼- to 3-inch angular chert fragments; strongly acid; gradual, wavy boundary.

B22t—12 to 22 inches, strong-brown (7.5YR 5/6) clay; few, fine and medium, faint, yellowish-brown and brown mottles; moderate to strong, medium, angular blocky structure; firm; continuous clay films; few fine roots; few fine, dark-colored concretions; strongly acid; gradual, wavy boundary.

B23t—22 to 30 inches, yellowish-brown (10YR 5/6) clay; common, fine and medium, distinct, brown (7.5YR 4/4), yellowish-red (5YR 5/6), and pale-brown (10YR 6/3) mottles; strong, medium, angular blocky structure; firm; continuous clay films; few fine roots; few fine, dark-colored concretions; strongly acid; gradual, wavy boundary.

B24t—30 to 40 inches, yellowish-brown (10YR 5/6) clay; many, medium and coarse, distinct, pale-brown (10YR 6/3) and strong-brown (7.5YR 5/6) mottles; weak, medium and coarse, angular blocky structure; firm; patchy clay films; few fine roots; common fine, dark-colored concretions; strongly acid; gradual, wavy boundary.

B25t—40 to 50 inches, mottled light yellowish-brown (10YR 6/4), yellowish-brown (10YR 5/6), and light brownish-gray (10YR 6/2) clay; weak, medium and coarse, angular blocky structure; very firm; common medium and large, dark-colored concretions; some thick stains along cracks and on ped surfaces; strongly acid; gradual, wavy boundary.

C—50 to 55 inches, mottled light olive-brown (2.5Y 5/4), light brownish-gray (10YR 6/2), yellowish-brown (10YR 5/4), and gray (N 6/0) clay; massive; very

firm; common fine and medium, dark-colored concretions; medium acid.
R—55 inches, phosphatic limestone bedrock.

Depth to limestone bedrock ranges from 40 to 60 inches. The soil is medium to high in content of phosphorus. Reaction is commonly medium acid to very strongly acid in the A horizon and the upper part of the B horizon and medium acid to neutral in the horizon just above bedrock.

The A horizon ranges from 4 to 10 inches in thickness. It is mainly creep from associated cherty soils and is 15 to 30 percent chert. In places it contains weathered shale fragments. It is brown or dark-brown cherty silt loam or cherty silty clay loam. The B horizon is dominantly brown, yellowish-brown, or strong-brown clay or silty clay. In places the C horizon is absent and the B horizon extends to bedrock.

MrD—Mimosa-Rock outcrop complex, 5 to 20 percent slopes. This complex is on uplands of the Outer Central Basin. It consists of sloping and moderately steep soils and outcrops of limestone. Outcrops of rock cover 5 to 25 percent of the land surface. The soil between the outcrops has a surface layer of brown or dark-brown silt loam or silty clay loam. In places the surface layer contains chert fragments that rolled or washed from higher cherty soils. The subsoil is dominantly brown, yellowish-brown, or strong-brown, firm clay that is commonly mottled in shades of yellow, brown, and gray in the lower part. Depth of the soil between the outcrops ranges from about 40 to 60 inches.

Included with this complex in mapping are small areas of intermingled soils that have more than 25 percent of the surface covered with outcrops of limestone. Also included between the outcrops are a few areas of soils that are less than 40 inches deep and a few areas of soils that have a thick, dark-colored surface layer.

The Mimosa soil in this complex is commonly medium acid to very strongly acid in the upper part and medium acid to neutral in the layer just above bedrock. It is medium to high in content of phosphorus. Runoff is medium to rapid, permeability is moderately slow, and available water capacity is low to medium.

Outcrops of limestone make tillage with machinery impractical. Permanent pasture can be grown, but clipping and other management practices are difficult. About two-thirds of the acreage was once cleared, but many areas are now either idle or reverting to trees, mainly locust and redcedar. Pasture is mostly unimproved, and most wooded areas are grazed. Capability unit VIs–2; woodland group 4x3.

MrE—Mimosa-Rock outcrop complex, 20 to 40 percent slopes. This complex is mostly on uplands in the Outer Central Basin, but a few areas are on the steeper slopes of the Inner Central Basin. It consists of steep soils and outcrops of limestone. Outcrops of rock cover 5 to 90 percent of the land surface. In most places the soil between the outcrops has a thin surface layer of brown or dark-brown cherty silt loam. In places the surface layer is free or nearly free of chert, and in places it is silty clay loam or silty clay. The subsoil is brown, yellowish-brown, or strong-brown, firm clay.

Included with this complex in mapping are small areas of intermingled soils that have few or no outcrops of rock. Also included are areas where the soil between the outcrops is less than 20 inches deep.

Because of the slope, the outcrops of rock, and the severe hazard of erosion, this complex is unsuited to crops and in most areas is poorly suited to pasture. Fair permanent pasture can be grown under a high level of management on some areas, but most of the acreage is better suited to trees. Most of the acreage is in drought-tolerant hardwoods and redcedar. Most areas are grazed. Capability unit VIIs–1; woodland group 4x3.

MsC—Mimosa soils, 5 to 12 percent slopes. These sloping, well-drained soils are on uplands of the Outer Central Basin. They formed in residuum weathered from phosphatic limestone. The surface layer is brown or dark-brown cherty silt loam or silt loam 5 to 10 inches thick, and in many places it has some clay from the subsoil mixed in it. Most of the chert fragments in the surface layer washed or rolled from other cherty soils. The subsoil is dominantly yellowish-brown or strong-brown, firm clay. The lower part of the subsoil is commonly mottled with shades of yellow, brown, and gray. Depth to bedrock is 40 to 60 inches.

Included with these soils in mapping are a few areas of soils that have a subsoil of yellowish-red silty clay or clay and a few areas of soils that have slopes of 2 to 5 percent. Also included are a few areas of soils that are more than 60 inches deep to bedrock, a few areas of soils that are less than 40 inches deep to rock, and small areas of intermingled soils that have a few outcrops of rock.

These soils are commonly medium acid to very strongly acid in the upper part and medium acid to neutral in the layer just above bedrock. They are medium to high in content of phosphorus. Runoff is medium to rapid, permeability is moderately slow, and available water capacity is medium.

These soils are suited to pasture and moderately well suited to most commonly grown crops. They are better suited to small grain, hay, and pasture than to row crops that require frequent tillage and large amounts of water in summer. About three-fourths of the acreage has been cleared and is used mainly for pasture. Capability unit IVe–3; woodland group 3o7.

MsD—Mimosa soils, 12 to 20 percent slopes. These moderately steep, well-drained soils are on uplands of the Outer Central Basin. They formed in residuum weathered from phosphatic limestone. The surface layer is brown or dark-brown cherty silt loam or silt loam 4 to 9 inches thick, and it has some clay from the subsoil mixed in it. Most of the chert fragments in the surface layer washed or rolled from other cherty soils. The subsoil is dominantly yellowish-brown or strong-brown, firm clay. The lower part of the subsoil is commonly mottled with shades of yellow, brown, and gray. Depth to limestone bedrock is 40 to 60 inches.

Included with these soils in mapping are a few areas of soils that have a subsoil of yellowish-red silty clay or clay and a few areas of soils that are severely eroded and have a clayey surface layer. Also included are a few areas of soils that are more than 60 or less than 40 inches deep to rock and small areas of intermingled soils that have a few outcrops of limestone.

These soils are commonly medium acid to very strongly acid in the upper layers and medium acid to neutral in the layer just above bedrock. They are me-

dium to high in content of phosphorus. Runoff is medium.

These soils are well suited to pasture and most hay crops. They are poorly suited to cultivated crops. Severely eroded included soils generally have poor tilth. Slope, the moderately slow permeability, and the medium to rapid runoff cause these soils to be highly susceptible to erosion. About two-thirds of the acreage has been cleared and is used mainly for pasture. Much of the pasture, however, is unimproved. Many areas are either idle or are reverting to trees, mainly locust and redcedar. Capability unit VIe–2; woodland group 3o7.

MsE—Mimosa soils, 20 to 30 percent slopes. These steep, well-drained soils are on uplands of the Outer Central Basin. They formed in residuum derived from phosphatic limestone. These soils have the profile described as representative of the series. The surface layer is brown or dark-brown cherty silt loam or silty clay loam 4 to 8 inches thick. It consists mostly of material washed and rolled from other cherty soils and has some clay from the subsoil mixed in it. The subsoil is dominantly brown, yellowish-brown, or strong-brown, firm clay. The lower part of the subsoil is commonly mottled with shades of yellow, brown, and gray. Limestone bedrock is between depths of 40 and 60 inches.

Included with this soil in mapping are a few areas of soils that are less than 40 inches deep to bedrock and intermingled soils that have a few outcrops of limestone.

These soils are commonly medium acid to very strongly acid in the upper part and medium acid to neutral in the layer just above bedrock. They are medium to high in content of phosphorus. Permeability is moderately slow, runoff is rapid, and available water capacity is medium to low.

These soils are too steep and too highly susceptible to erosion to be used for cultivated crops. If limed, fertilized, and otherwise well managed, they are suited to most commonly grown pasture plants. About two-thirds of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, many areas are idle, and many are reverting to trees, mainly locust and redcedar. Capability unit VIe–2; woodland group 3r8.

Nesbitt Series

The Nesbitt series consists of well drained and moderately well drained, deep soils that have a weak fragipan in the subsoil at a depth of about 2 feet. These soils formed in 3 to 8 feet of old alluvium or mixed loess and alluvium and in the underlying clay, which formed in material weathered from limestone. They are on uplands of the Inner Central Basin. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark reddish-brown silt loam about 8 inches thick. The upper 17 inches of the subsoil is reddish-brown, friable silty clay loam; the next 30 inches is yellowish-red and strong-brown silty clay loam that is firm and brittle in about one-half of the mass; and the lower 10 inches or more is yellowish-brown, firm and plastic clay mottled with shades of brown and gray.

Representative profile of Nesbitt silt loam, 2 to 5 percent slopes:

Ap—0 to 8 inches, dark reddish-brown (5YR 3/3) silt loam; weak, medium, granular structure; friable; common fine roots; few fine, dark-colored concretions; strongly acid; clear, smooth boundary.

B21t—8 to 14 inches, reddish-brown (5YR 4/4) silty clay loam; weak, medium, subangular blocky structure; friable; thin patchy clay films; common fine roots; few fine, dark-colored concretions; strongly acid; gradual, wavy boundary.

B22t—14 to 25 inches, reddish-brown (5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; few fine, dark-colored concretions; strongly acid; clear, wavy boundary.

B23t—25 to 33 inches, yellowish-red (5YR 4/6) silty clay loam; common, medium, distinct, light-brown (7.5YR 6/4), dark-red (2.5YR 3/6), and light brownish-gray (10YR 6/2) mottles; moderate, medium, angular and subangular blocky structure; firm and brittle in about one-half of the mass, friable in about one-half; patchy clay films; few fine roots; common fine, dark-colored concretions; strongly acid; gradual, smooth boundary.

B24t—33 to 41 inches, yellowish-red (5YR 4/6) silty clay loam; common, medium, distinct, pale-brown (10YR 6/3), strong-brown (7.5YR 5/6), and light brownish-gray (10YR 6/2) mottles; moderate, medium, angular blocky structure; firm in about one-half of the mass, brittle in about one-half; patchy clay films; common fine, dark-colored concretions; strongly acid; gradual, smooth boundary.

B25t—41 to 55 inches, strong-brown (7.5YR 5/6) silty clay loam; common, medium and fine, distinct, yellowish-red (5YR 5/6), pinkish-gray (7.5YR 7/2), yellowish-brown (10YR 5/6), and light yellowish-brown (10YR 6/4) mottles; weak, medium and coarse, angular blocky structure; firm in about one-half of the mass, brittle in about one-half; continuous clay films; common fine, dark-colored concretions; strongly acid; gradual, smooth boundary.

IIB26t—55 to 65 inches, yellowish-brown (10YR 5/6) clay; common, fine and medium, distinct, very pale brown (10YR 7/4), strong-brown (7.5YR 5/6), and light-gray (10YR 6/1) mottles; weak, medium and coarse, angular blocky structure; massive in parts; very firm and plastic; common fine and medium, dark-colored concretions; strongly acid.

The loamy mantle ranges from about 3 to 8 feet in thickness. It is generally old alluvium, but in places the upper 1 foot or 2 feet is loess or mixed loess and alluvium. Depth to limestone bedrock ranges from 5 to 8 feet or more. Reaction is strongly acid in the upper part of the soil and ranges from strongly acid to medium acid in the clayey lower part.

The A horizon is dark reddish-brown, dark-brown, or very dark grayish-brown silt loam 5 to 9 inches thick. The B horizon is dominantly reddish-brown, yellowish-red, strong-brown, or yellowish-brown silt loam or silty clay loam. It is friable and free of mottles to a depth of about 20 to 30 inches. From these depths to the underlying clay IIB horizon, the B horizon is commonly mottled with shades of red, yellow, brown, and gray and is firm and brittle in parts of the mass. The underlying clay IIB horizon is yellowish brown, strong brown, or yellowish red that is commonly mottled with shades of gray, yellow, brown, and red.

NeA—Nesbitt silt loam, 0 to 2 percent slopes. This nearly level soil is on uplands in the Inner Central Basin. It has weak fragipan-like properties at a depth of about 2 feet. It formed in 3 to 8 feet of old alluvium or mixed loess and alluvium and in the underlying clay

weathered from limestone. The surface layer is dark reddish-brown, dark-brown, or very dark grayish-brown silt loam 5 to 9 inches thick. The upper 20 to 30 inches of the subsoil is reddish-brown, yellowish-red, or strong-brown, friable silt loam. Below this, to a depth of 3 to 8 feet, the subsoil is dominantly yellowish-red, strong-brown, or yellowish-brown silty clay loam that is mottled with shades of gray, yellow, brown, and red and is firm and brittle in parts of the mass. Below a depth of 3 to 8 feet is mottled, yellowish-brown, strong-brown, or yellowish-red, firm, plastic clay. Limestone bedrock is at a depth of 5 to 8 feet or more.

Included with this soil in mapping are a few small areas of soils that have a strongly developed fragipan. Also included are a few areas of soils that have no properties of a fragipan in the subsoil.

This soil is commonly strongly acid in the upper part and medium acid to strongly acid in the clayey lower part. It has a deep root zone. Runoff is slow, permeability is moderate, and available water capacity is high.

This soil is well suited to most commonly grown crops and pasture plants. It is easy to work and, if well managed, can be used intensively for crops. Most of the acreage has been cleared and is used mainly for crops and pasture. Much of the pasture is unimproved, and a few areas are idle. Capability unit I–1; woodland group 3o7.

NeB—Nesbitt silt loam, 2 to 5 percent slopes. This gently sloping, well drained to moderately well drained soil is on uplands of the Inner Central Basin. It has weak fragipan-like properties at a depth of about 2 feet. It has the profile described as representative of the series. The surface layer is dark reddish-brown or dark-brown silt loam 5 to 8 inches thick. The subsoil, to a depth of about 25 inches, is reddish-brown or yellowish-red, friable silty clay loam. Below this, the subsoil is yellowish-red or strong-brown silty clay loam that is mottled with yellow, red, brown, and gray and is firm and brittle in parts of the mass. Clay that formed in material weathered from limestone is at a depth of 3 to 8 feet. Limestone bedrock is at a depth of 5 to 8 feet or more.

Included with this soil in mapping are small areas of soils that have a strongly developed fragipan. Also included are a few areas of severely eroded soils that have a thin surface layer of brown or reddish-brown silty clay loam and a few areas of soils that have no properties of a fragipan.

This soil is commonly strongly acid in the surface layer and the upper part of the subsoil and medium acid to strongly acid in the clayey lower part. It has a deep root zone. Runoff and permeability are moderate, and available water capacity is high.

This soil is well suited to most commonly grown crops and pasture plants. It is easy to work, and response to management is good. Most of the acreage has been cleared and is used mainly for crops and pasture. Much of the pasture is unimproved, and a few areas are idle. Capability unit IIe–1; woodland group 3o7.

Pits and Dumps

Pd—Pits and Dumps. This miscellaneous land type consists of excavations, open pits, and uneven accumulations or piles of waste or debris (fig. 16). The largest areas of this mapping unit consist of excavations for road fill along Interstate Highway 24 and on the old Stewart Air Base. Other areas scattered throughout the county consist of limestone quarries, limestone quarry dumps, garbage dumps, and other excavations for earth fill.

In their present conditions, most areas of Pits and Dumps have no value for farming. Not placed in a capability unit or woodland group.

Roellen Series

The Roellen series consists of poorly drained, deep soils. These soils formed mainly in clayey alluvium. They are along streams and in depressions. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is very dark gray silty clay and clay about 21 inches thick. The subsoil is dark-gray, firm clay that is mottled with dark yellowish brown and very dark grayish brown and is about 11 inches thick. Below this is mottled light olive-brown, gray, yellowish-brown, and very dark gray, very firm clay that extends to a depth of more than 58 inches.

Representative profile of Roellen silty clay:

Ap—0 to 7 inches, very dark gray (10YR 3/1) silty clay; strong, fine and medium, granular structure; friable; common fine roots; common fine and medium, dark-colored concretions; few small, weathered chert fragments; slightly acid; abrupt, smooth boundary.

A12—7 to 16 inches, very dark gray (5Y 3/1) clay; moderate, fine and medium, angular blocky structure; firm; glossy ped surfaces; common fine roots; common fine and medium, dark-colored concretions; neutral; clear, smooth boundary.

A13—16 to 21 inches, very dark gray (5Y 3/1) clay; common, fine and medium, distinct, olive-brown (2.5Y 4/4) and olive (5Y 5/4) mottles; moderate, fine and medium, angular blocky structure; firm; few fine roots; common fine and medium, dark-colored concretions; mildly alkaline; clear, smooth boundary.

Bg—21 to 32 inches, dark-gray (5Y 4/1) clay; common, fine and medium, distinct, dark yellowish-brown (10YR 4/4), very dark grayish-brown (2.5Y 3/2), and dark-gray (N 4/0) mottles; weak, medium and coarse, angular blocky structure; firm; few fine roots; common fine and medium, dark-colored concretions; few small weathered, white chert fragments; mildly alkaline; gradual, smooth boundary.

Cg—32 to 58 inches, mottled light olive-brown (2.5Y 5/4), gray (N 6/0), yellowish-brown (10YR 5/6), and very dark gray (5Y 3/1) clay; massive; very firm; common fine and medium, dark-colored concretions; few small, weathered chert fragments; mildly alkaline.

Depth to limestone bedrock ranges from 40 inches to about 8 feet. When the soil dries out, cracks ¼ to 1 inch across extend to a depth of 20 inches or more. In places the soil is medium to high in content of phosphorus. Reaction is medium acid to mildly alkaline throughout.

The A horizon is very dark gray, very dark grayish brown, very dark brown, or black and ranges from 10 to 24 inches in thickness. The upper 4 to 10 inches of the A

Figure 16.—Excavated areas, such as this one, are mapped as Pits and Dumps and shown on the soil maps by the symbol "Pd."

horizon is silty clay or silty clay loam, and the lower part is clay, silty clay, or silty clay loam. The B horizon is domiantly dark-gray, gray, dark grayish-brown, light brownish-gray, olive-gray, or light olive-gray clay that is commonly mottled with various shades of yellow, brown, and olive. The C horizon is mottled, massive clay that is similar in color to the B horizon.

Ro—Roellen silty clay loam. This nearly level, poorly drained soil is along streams and in depressions. It formed in clayey alluvium. The surface layer is very dark gray, very dark grayish brown, or very dark brown. It is silty clay loam in the upper part and silty clay or clay in the lower part, and it is 10 to 24 inches thick. The subsoil, to a depth of 30 to 40 inches, is dominantly gray clay that is mottled with shades of yellow, brown, and olive. Below this is mottled, massive, very firm clay. Limestone bedrock is at a depth of 40 inches to 8 feet or more.

Included with this soil in mapping are a few areas of soils that have a surface layer more than 24 or less than 10 inches thick. Also included are a few areas of soils that are 20 to 40 inches deep to bedrock.

Because of the clayey surface layer, this soil is difficult to work except when the moisture is nearly optimum. The soil is medium acid to mildly alkaline. In places it is medium to high in content of phosphorus. Runoff and permeability are slow, and in most places the soil is waterlogged during most of the winter because of frequent flooding, a high water table, or seepage from higher adjacent soils.

This soil is suited to shallow-rooted crops that can be planted late in spring and to pasture plants that can withstand wetness. About 75 percent of the acreage has been cleared and is used mainly for crops and pasture. Flooding, ponding, and the high water table are the main concerns of management. If well managed, the soil can be used intensively for selected crops. Capability unit IIIw–1; woodland group 2w9.

Ru—Roellen silty clay. This nearly level, poorly drained soil is along streams and in depressions. It formed in clayey alluvium. It has the profile described as representative of the series. Most areas are subject to flooding or ponding. Limestone bedrock is at a depth of more than 40 inches.

Included with this soil in mapping are a few areas of soils that have a dark-colored surface layer more than 24 or less than 10 inches thick. Also included are a few areas of soils that are 20 to 40 inches deep to rock and small areas of intermingled soils that have a few outcrops of rock.

This soil is medium acid to mildly alkaline. In places it is medium to high in content of phosphorus. Runoff and permeability are slow, and in most places the soil is waterlogged during most of the winter because of frequent flooding, a high water table, or seepage from higher adjacent soils. When wet, the soil is sticky and plastic; when dry, it is hard to cloddy (fig. 17).

This soil is suited to shallow-rooted crops that can be planted late in spring and to pasture plants that can withstand wetness. About 75 percent of the acreage has been cleared and is used for crops and pasture.

Figure 17.—**Area of Roellen silty clay. This soil becomes cloddy if it is plowed when wet, but it slacks upon drying and wetting.**

Flooding, ponding, and the fine-textured plow layer are the main concerns of management. If well managed, the soil can be used intensively for selected crops. Capability unit IIIw–1; woodland group 2w9.

Sandhill Series

The Sandhill series consists of well-drained, deep phosphatic soils that contain a relatively high percentage of sand and sandy fragments. These soils formed in material weathered from interbedded phosphatic sandy limestone and shale. They are on hillsides in the Outer Central Basin. Slopes range from 12 to 30 percent.

In a representative profile, the surface layer is dark-brown channery loam about 7 inches thick. The subsoil extends to a depth of about 43 inches. The upper 8 inches is dark yellowish-brown, friable channery loam; the lower 28 inches is brown and strong-brown, friable channery and flaggy clay loam. Below this is stratified sandy limestone and shale separated by thin layers of mottled brownish-yellow and strong-brown clay loam. Hard, interbedded limestone and shale is at a depth of 50 inches.

Representative profile of Sandhill channery loam, 20 to 30 percent slopes:

Ap—0 to 7 inches, dark-brown (10YR 3/3) channery loam; moderate, fine, granular structure; very friable; many fine roots; about 20 percent, by volume, sandy limestone fragments, ½ inch to 6 inches long and ¼ inch to 3 inches thick, a few fragments as much as 10 inches long; medium acid; clear, smooth boundary.

B1—7 to 15 inches, dark yellowish-brown (10YR 4/4) channery loam; weak, medium, subangular blocky structure; friable; common fine roots; common small and medium pores or voids; common wormcasts; 25 percent, by volume, sandy limestone fragments, ½ inch to 10 inches long and ¼ inch to 3 inches thick; medium acid; clear, smooth boundary.

B21t—15 to 27 inches, brown (7.5YR 4/4) channery clay loam; moderate medium, subangular blocky structure; friable; patchy clay films; common fine roots; few fine and medium, black concretions; common small pores or voids; 30 percent, by volume, sandy limestone fragments, about two-thirds ½ inch to 6 inches long and one-third 6 to 12 inches long; strongly acid; gradual, smooth boundary.

B22t—27 to 35 inches, brown (7.5YR 4/4) flaggy clay loam; few, fine, faint, reddish-brown and strong-brown mottles; moderate, medium, subangular blocky structure; friable; continuous clay films; few fine roots; few fine, black concretions; 30 percent, by volume, sandy limestone fragments, about one-half less than 6 inches long and one-half 6 to 16 inches long; strongly acid; clear, smooth boundary.

B23t—35 to 43 inches, strong-brown (7.5YR 5/6) flaggy clay loam; common, fine and medium, distinct, reddish-brown (5YR 4/4) and yellowish-brown (10YR 5/4) mottles; weak, medium, angular blocky structure; friable; patchy clay films; about 35 percent, by volume, sandy limestone fragments, mostly 6 to 18 inches long; strongly acid; gradual, wavy boundary.

C—43 to 50 inches, soft, weathered, stratified sandy limestone and shale separated by thin layers of mottled brownish-yellow (10YR 6/6) and strong-brown (7.5YR 5/6) clay loam; structureless; spacing between cracks in rocks is 1 inch to 3 inches; strongly acid.

R—50 inches, interbedded phosphatic limestone and shale.

Depth to hard bedrock ranges from 40 to about 65 inches. The A and B horizons range from about 15 to 35 percent, by volume, coarse fragments, and the C horizon is as much as 80 percent. Commonly, the fragments increase in both size and amount with increasing depth. Reaction is medium acid or strongly acid throughout the profile.

The A horizon is dark-brown, brown, or dark yellowish-brown channery loam 5 to 10 inches thick. The B horizon is brown, dark yellowish brown, yellowish brown, strong brown, or reddish brown. The lower part of the B horizon and the C horizon commonly have few to many mottles in shades of brown, yellow, and red. The B horizon is dominantly channery or flaggy clay loam or channery or flaggy loam, but in places there are thin subhorizons of silt loam, silty clay loam, and clay.

SaD—Sandhill channery loam, 12 to 20 percent slopes. This moderately steep, well-drained phosphatic soil is on hillsides in the Outer Central Basin. The soil has a relatively high content of sand and sandy fragments. It formed in material weathered from interbedded phosphatic sandy limestone and shale. The surface layer is dark-brown or brown channery loam 5 to 10 inches thick. The subsoil, to a depth of about 40 inches, is brown, dark yellowish-brown, strong-brown, or reddish-brown, friable channery or flaggy loam or clay loam. Below this is stratified sandy limestone and shale separated by thin layers of mottled brownish-yellow and strong-brown clay loam, silt loam, silty clay loam, or clay. Sandy limestone fragments ½ inch to 6 inches long and ¼ inch to 3 inches thick make up 15 to 25 percent of the upper 10 to 15 inches of the soil. The fragments commonly increase in both size and amount with increasing depth. Hard bedrock is at a depth of 40 to about 65 inches.

Included with this soil in mapping are a few areas of severely eroded soils that have a thin surface layer of channery clay loam. Also included are a few areas of soils that have few or no coarse fragments in the upper 15 to 24 inches and a few areas of flaggy soils that have a clayey subsoil.

This soil is medium acid to strongly acid and me-

dium to high in content of phosphorus. It has a deep root zone. Runoff is medium to rapid, permeability is moderately rapid, and available water capacity is low to medium.

Slope and the coarse fragments on the surface interfere with tillage and make this soil difficult to work. The soil is better suited to permanent pasture, hay, and trees than to other uses. About half of the acreage has been cleared and is used mostly for pasture or is idle. Capability unit VIs–1; woodland group 3f8.

SaE—Sandhill channery loam, 20 to 30 percent slopes. This steep, well-drained, phosphatic soil is on hillsides in the Outer Central Basin. It has a relatively high content of sand and sandy fragments. It formed in material weathered from interbedded phosphatic sandy limestone and shale. It has the profile described as representative of the series. The surface layer is dark-brown or brown channery loam 5 to 10 inches thick. The subsoil is dominantly brown or strong-brown, friable channery or flaggy clay loam. Sandy limestone fragments ½ inch to 6 inches long and ¼ inch to 3 inches thick make up 15 to 25 percent of the upper 10 to 15 inches of the soil. The fragments commonly increase in both size and amount with increasing depth. Hard bedrock is at a depth of about 40 to 65 inches.

Included with this soil in mapping, and making up about one-third of the acreage, are areas of severely eroded soils that have a thin surface layer of brown or dark yellowish-brown channery clay loam or loam. Also included are a few areas of flaggy soils that have a clayey subsoil and a few areas of soils that are free or nearly free of coarse fragments in the upper 15 to 24 inches.

This soil is medium acid to strongly acid and medium to high in content of phosphorus. It has a deep root zone. Runoff is medium to rapid, permeability is moderately rapid, and available water capacity is low to medium.

This soil is better suited to permanent pasture and trees than to other uses. Slope and the coarse fragments make the soil difficult to work. About half of the acreage has been cleared and is used for pasture or is idle. Capability unit VIIs–1; woodland group 3f8.

Stiversville Series

The Stiversville series consists of well-drained, deep soils. These soils formed in loamy material weathered from interbedded sandy limestone and shale. They are on ridgetops and hillsides in the Outer Central Basin. Slopes range from 2 to 40 percent.

In a representative profile, the surface layer is brown silt loam about 8 inches thick. The upper 11 inches of the subsoil is dark yellowish-brown silt loam; the lower 31 inches is brown and reddish-brown, friable clay loam that has few to many small fragments of sandy limestone. Below this is mottled clay loam between coarse fragments of sandy limestone. Hard, interbedded phosphatic sandy limestone and shale is at a depth of 58 inches.

Representative profile of Stiversville silt loam, 5 to 12 percent slopes:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; ¼- to 1-inch, weathered fragments of sandy limestone; medium acid.

B1—8 to 19 inches, dark yellowish-brown (10YR 4/4) silt loam; few, fine, faint, brown mottles; weak, fine, granular structure and weak, fine and medium, subangular blocky structure; very friable; common fine roots; few ½- to 2-inch, weathered fragments of sandy limestone; medium acid.

B21t—19 to 28 inches, brown (7.5YR 4/4) clay loam; weak, fine and medium, subangular blocky structure; friable; patchy clay films; common fine roots; few fine, black concretions; few ¼- to 2-inch, weathered fragments of sandy limestone; strongly acid.

B22t—28 to 39 inches, reddish-brown (5YR 4/4) clay loam; moderate, fine and medium, subangular and angular blocky structure; friable; continuous clay films; few fine roots; few fine, black concretions; common ¼- to 2-inch fragments of sandy limestone; strongly acid.

B23t—39 to 50 inches, brown (7.5YR 4/4) clay loam; few, fine, faint, strong-brown mottles; moderate, fine and medium, angular blocky structure; friable; patchy clay films; few fine roots; many ¼- to 3-inch fragments of sandy limestone; strongly acid.

C—50 to 58 inches, mottled strong-brown (7.5YR 5/6), reddish-brown (5YR 4/4), yellowish-brown (10YR 5/6), and pale-brown (10YR 6/3) clay loam; about 50 percent, by volume, ½- to 6-inch fragments of sandy limestone; massive; firm; common fine and medium, black concretions; strongly acid.

R—58 inches, hard, interbedded phosphatic sandy limestone and shale.

Depth to hard bedrock ranges from about 40 to 65 inches. The A and B horizons range from 0 to 10 percent fragments of weathered sandy limestone. The sandy fragments commonly increase in both size and amount with increasing depth. Reaction is medium acid or strongly acid throughout.

The A horizon is brown or dark-brown silt loam or loam about 4 to 10 inches thick. The B horizon is brown, dark yellowish brown, strong brown, or reddish brown. It is mostly loam or clay loam, but in places there are thin subhorizons of silt loam, silty clay loam, and clay. The lower part of the B horizon and the C horizon are commonly mottled with various shades of brown, yellow, red, and gray.

StB—Stiversville silt loam, 2 to 5 percent slopes. This deep, gently sloping, well-drained phosphatic soil is on broad ridgetops in the Outer Central Basin. It formed in residuum weathered from interbedded phosphatic sandy limestone and shale. In most places weathered sandy limestone fragments are in the lower part of the subsoil, and in places a few small fragments are on the surface. The surface layer is brown or dark-brown silt loam or loam 5 to 10 inches thick. The subsoil is brown, dark yellowish-brown, reddish-brown, or strong-brown, friable clay loam or loam. Hard bedrock is at a depth of 40 to about 65 inches.

Included with this soil in mapping are a few areas of soils that have a subsoil of reddish-brown or yellowish-red silty clay loam or silty clay. Also included are a few areas of severely eroded soils that have a thin plow layer of brown or dark yellowish-brown clay loam or loam.

This soil is medium acid to strongly acid throughout and medium to high in content of phosphorus. It has a deep root zone. Runoff is medium, permeability is moderately rapid, and available water capacity is high.

This soil is well suited to all commonly grown crops and pasture plants. It is easy to work, and the re-

sponse to management is excellent. Most of the acreage has been cleared and is used for crops and pasture. Capability unit IIe–1; woodland group 3o7.

StC—Stiversville silt loam, 5 to 12 percent slopes. This deep, sloping, well-drained phosphatic soil is on ridgetops and side slopes of uplands in the Outer Central Basin. It formed in residuum weathered from interbedded phosphatic limestone and in shale or colluvium weathered from similar sources. It has the profile described as representative of the series. The surface layer is brown or dark-brown silt loam or loam 4 to 10 inches thick. The upper part of the subsoil is mostly brown, dark yellowish-brown, strong-brown, or reddish-brown loam or clay loam, but in places it is thin layers of silt loam, silty clay loam, and clay. The lower part is commonly mottled with shades of brown, yellow, red, and gray. In most places a few small sandy fragments are on the surface. Sandy fragments commonly increase in both size and amount with increasing depth. Hard bedrock is at a depth of 40 to 65 inches.

Included with this soil in mapping are a few areas of soils that have a subsoil of reddish-brown or yellowish-red silty clay loam or silty clay. Also included are a few areas of severely eroded soils that have a thin surface layer of brown or dark yellowish-brown clay loam or loam.

This soil is medium acid to strongly acid throughout and medium to high in content of phosphorus. It has a deep root zone. Runoff is medium, permeability is moderately rapid, and available water capacity is medium.

This soil is easy to work. It is well suited to all crops and pasture plants commonly grown in the county. Controlling erosion is the main concern of management. Response to management is good. About two-thirds of the acreage has been cleared and is used mainly for crops and pasture. Much of the pasture is unimproved, and a fairly large acreage is idle. Capability unit IIIe–1; woodland group 3o7.

StD—Stiversville silt loam, 12 to 20 percent slopes. This deep, moderately steep, well-drained phosphatic soil is on uplands in the Outer Central Basin. It formed in residuum weathered from interbedded phosphatic sandy limestone and in shale or colluvium weathered from similar sources. In most places fragments of weathered sandy limestone are in the lower part of the subsoil, and in many places a few small fragments are on the surface. The surface layer is brown or dark-brown silt loam or loam 4 to 8 inches thick. The subsoil is brown, dark yellowish brown, strong brown, or reddish brown. It is mostly clay loam or loam, but in places it is thin layers of silt loam, silty clay loam, and clay. The layer just above hard bedrock is commonly mottled with shades of brown, yellow, red, and gray and is as much as 75 percent, by volume, sandy limestone fragments. Hard bedrock is at a depth of about 40 to 65 inches.

Included with this soil in mapping are a few areas of severely eroded soils that have a thin surface layer of brown, dark yellowish-brown, or strong-brown clay loam or loam. Most of these severely eroded areas have shallow gullies and a few deep gullies. Also included are a few areas of soils that have a clayey subsoil and a few areas of soils that have coarse fragments of sandy limestone on the surface and throughout the soil.

This soil is medium acid to strongly acid throughout and medium to high in content of phosphorus. It has a deep root zone. Runoff is medium to rapid, permeability is moderately rapid, and available water capacity is medium.

This soil is suited to all crops and pasture plants commonly grown in the county. Controlling erosion is the main concern of management. Response to management is good. If the soil is well managed, cultivated crops can be grown occasionally. About two-thirds of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and a large acreage is idle. Capability unit IVe–1; woodland group 3o7.

StE—Stiversville silt loam, 20 to 40 percent slopes. This deep, steep, well-drained phosphatic soil is on hillsides in the Outer Central Basin. It formed in residuum weathered from interbedded phosphatic sandy limestone and in shale or colluvium weathered from similar sources. In most places a few weathered sandy fragments are on the surface. Fragments of sandy limestone commonly increase in both size and amount with increasing depth. The surface layer is brown or dark-brown silt loam or loam 4 to 8 inches thick. The subsoil, to a depth of about 45 inches, is brown, dark yellowish brown, strong brown, or reddish brown. It is dominantly clay loam or loam, but in places it is thin silt loam, silty clay loam, and clay. Below this is mottled clay loam that in places is as much as 75 percent, by volume, sandy limestone fragments. Hard bedrock is at a depth of about 40 to 60 inches.

Included with this soil in mapping are a few small areas of loamy soils that have coarse sandy limestone fragments scattered over the surface and throughout the soil. Also included are a few areas of flaggy soils that have a clayey subsoil.

This soil is medium acid to strongly acid throughout and medium to high in content of phosphorus. Runoff is medium to rapid, permeability is moderately rapid, and available water capacity is medium.

This soil has good tilth and is fertile, but it is too steep to be used for cultivated crops. It is better suited to pasture and trees than to other uses. About half of the acreage has been cleared and is used mostly for pasture or is idle. Capability unit VIe–1; woodland group 3r8.

Talbott Series

The Talbott series consists of well-drained, moderately deep soils that have a clayey subsoil. These soils formed in material weathered from limestone. They are on uplands in the Inner Central Basin. Slopes range from 0 to 20 percent.

In a representative profile, the surface layer is brown silt loam about 6 inches thick. The upper 19 inches of the subsoil is yellowish-red, firm and very firm clay; the lower 12 inches is yellowish-brown and light olive-brown, very firm and plastic clay mottled with shades of brown, olive, red, and gray. Limestone bedrock is at a depth of 37 inches.

Representative profile of Talbott silt loam, 2 to 5 percent slopes, eroded:

Ap—0 to 6 inches, brown (10YR 4/3) silt loam; moderate, fine, granular structure; friable; many fine roots; few fine, black concretions; strongly acid; clear, smooth boundary.

B21t—6 to 10 inches, yellowish-red (5YR 4/6) clay; few, medium, distinct, brown (7.5YR 4/4) mottles; moderate, medium, angular and subangular blocky structure; firm; patchy clay films; common fine roots; few fine, black concretions; few small chert fragments as much as 1 inch in diameter; strongly acid; gradual, smooth boundary.

B22t—10 to 20 inches, yellowish-red (5YR 5/6) clay; common, fine and medium, distinct, yellowish-brown (10YR 5/4) and strong-brown (7.5YR 5/6) mottles; moderate to strong, medium, angular blocky structure; firm, plastic; continuous clay films; few fine roots; few fine, dark concretions; strongly acid; gradual, smooth boundary.

B23t—20 to 25 inches, yellowish-red (5YR 5/6) clay; common, fine and medium, distinct, yellowish-brown (10YR 5/6) and red (2.5YR 4/6) mottles; strong, medium and coarse, angular blocky structure; very firm, plastic; continuous clay films; few fine roots; few fine, dark concretions; strongly acid; clear, wavy boundary.

B24t—25 to 31 inches, yellowish-brown (10YR 5/6) clay; common, fine and medium, distinct, yellowish-red (5YR 4/6), light olive-brown (2.5Y 5/6), and pale-brown (10YR 6/3) mottles; moderate, coarse, angular blocky structure; very firm, plastic; continuous clay films; few fine, dark concretions; medium acid; gradual, smooth boundary.

B3—31 to 37 inches, light olive-brown (2.5Y 5/4) clay; common, fine and medium, distinct, yellowish-brown (10YR 5/6), light brownish-gray (10YR 6/2), and yellowish-red (5YR 5/6) mottles; massive; very firm, plastic; few fine, dark concretions; neutral.

R—37 inches, limestone rock.

Depth to bedrock ranges from 20 to 40 inches. In places the A horizon and the upper part of the B horizon are as much as 10 percent chert fragments. Reaction is strongly acid or medium acid in the A horizon and upper part of the B horizon and medium acid to mildly alkaline in the horizon just above bedrock.

The A horizon is brown, dark yellowish-brown, or yellowish-brown silt loam 4 to 10 inches thick. Where it is severely eroded, it ranges to yellowish-red and reddish-brown silty clay loam and finer. The upper part of the B horizon is yellowish-red, red, or strong-brown clay or silty clay. The lower part of the B horizon is dominantly yellowish-brown or light olive-brown clay that is commonly mottled with shades of red, yellow, brown, and gray. In places a thin C horizon is just above bedrock. It is similar in color and texture to the B3 horizon. Where the soil is adjacent to phosphatic soils, it has inherited a medium to high content of phosphorus by seepage, by a thin mantle of alluvium washed from phosphatic soils, or by both seepage and alluvium. Generally, where the soil has inherited phosphorus, the B horizon is browner than it is where the soil is low in phosphorus.

TaA—Talbott silt loam, 0 to 2 percent slopes. This nearly level, well-drained soil is on uplands in the Inner Central Basin. It formed in residuum weathered from limestone. The surface layer is brown silt loam 6 to 10 inches thick. The upper 10 to 20 inches of the subsoil is yellowish-red, red, or strong-brown, firm clay or silty clay. Below this, the subsoil is dominantly yellowish-brown, strong-brown, or light olive-brown, very firm, plastic clay that is commonly mottled with various shades of red, yellow, brown, and gray. Limestone bedrock is at a depth of 20 to about 40 inches.

Included with this soil in mapping are a few areas of soils that have a surface layer of dark-brown silt loam and a clayey subsoil. Also included are small, inseparable areas of soils that have a few outcrops of limestone on the surface.

This soil is medium acid to strongly acid in the surface layer and the upper part of the subsoil and medium acid to mildly alkaline in the lower part of the subsoil just above bedrock. The clayey subsoil restricts the penetration of most plant roots and the movement of water and air. Runoff is slow, permeability is moderately slow, and available water capacity is medium to low.

If limed, fertilized, and otherwise well managed, this soil is moderately well suited to row crops, small grain, hay, and pasture. Because the soil is droughty during prolonged dry periods, yields of most crops grown during summer are reduced. Most of the acreage has been cleared and is used mainly for crops and pasture. Capability unit IIe–2; woodland group 3c2.

TaB2—Talbott silt loam, 2 to 5 percent slopes, eroded. This gently sloping, well-drained soil is on uplands in the Inner Central Basin. It formed in residuum weathered from limestone. It has the profile described as representative of the series. The surface layer is 4 to 8 inches thick. In places a few chert fragments are on the surface, throughout the surface layer, and in the upper 3 to 6 inches of the subsoil. Depth to limestone bedrock is 20 to 40 inches.

Included with this soil in mapping are a few areas of soils that are more than 40 inches or less than 20 inches deep to bedrock. Also included are small, inseparable areas of soils that have a few outcrops of limestone on the surface (fig. 18).

This soil is medium acid to strongly acid in the surface layer and the upper part of the subsoil and medium acid to mildly alkaline in the layer just above bedrock. The clayey subsoil restricts the penetration of most plant roots and the movement of water and air. Runoff is medium to rapid, permeability is moderately slow, and available water capacity is medium to low.

This soil is highly susceptible to erosion, but if it is limed, fertilized, and otherwise well managed, it is moderately well suited to row crops, small grain, hay, and pasture. Because the soil is droughty during prolonged dry periods, yields of most crops grown during summer are reduced. About three-fourths of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and many areas are idle. A few areas are used for row crops and hay. Capability unit IIIe–3; woodland group 3c2.

TaC2—Talbott silt loam, 5 to 12 percent slopes, eroded. This sloping, well-drained soil is on uplands in the Inner Central Basin. It formed in residuum weathered from limestone. The surface layer is brown, friable silt loam 4 to 8 inches thick. The subsoil, to a depth of about 24 inches, is yellowish-red, red, or strong-brown, firm clay or silty clay. Below this, the soil is dominantly yellowish-brown or light olive-brown, firm, plastic clay that is commonly mottled with shades of red, yellow, brown, and gray. In places a few chert fragments are on the surface and throughout the upper 5 to 10 inches of the soil. Depth to limestone bedrock ranges from about 20 to 40 inches.

Figure 18.—**Pasture on Talbott silt loam, 2 to 5 percent slopes, eroded. The Gladeville soil in the foreground has limestone fragments on the surface.**

Included with this soil in mapping are a few areas of soils that are more than 40 inches or less than 20 inches deep to bedrock. Also included are inseparable areas of soils that have a few outcrops of limestone on the surface.

This soil is medium acid to strongly acid in the surface layer and upper part of the subsoil and medium acid to mildly alkaline in the layer just above bedrock. In many places where the soil is adjacent to phosphatic soils, it has inherited a medium to high content of phosphorus by seepage or by a thin mantle of alluvium washed from phosphatic soils. In these areas, the subsoil is generally browner than it is where the soil is low in phosphorus. The clayey subsoil restricts the penetration of most plant roots and the movement of water and air. Runoff is rapid, permeability is moderately slow, and available water capacity is low to medium.

This soil is moderately well suited to row crops, small grain, hay, and pasture. It is highly susceptible to erosion, and yields of most crops grown during summer are reduced by the lack of available water. Liming, fertilizing, and controlling erosion are important. About three-fourths of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and many areas are idle. A few areas are used for row crops. Capability unit IVe–3; woodland group 3c2.

TbB3—Talbott silty clay loam, 2 to 5 percent slopes, severely eroded. This gently sloping, well-drained, severely eroded soil is on uplands in the Inner Central Basin. Rills, shallow gullies, and a few deep gullies are common. This soil formed in residuum weathered from limestone. The surface layer is brown, yellowish-brown, strong-brown, or reddish-brown silty clay loam 3 to 5 inches thick that consists of material from the clayey subsoil mixed with the remaining original surface layer. The subsoil to a depth of 20 to 24 inches is yellowish-red, red, or strong-brown, firm clay or silty clay. Below this, the soil is dominantly yellowish-brown or light olive-brown, firm, plastic clay that is commonly mottled with shades of red, yellow, brown, and gray. In many places a few chert fragments are on the surface and throughout the upper 5 to 10 inches of the soil. Limestone bedrock is at a depth of 20 to 40 inches. It is exposed in many of the deeper gullies.

Included with this soil in mapping are a few areas of soils that are more than 40 inches or less than 20 inches deep to bedrock. Also included are areas of soils that have a few outcrops of limestone on the surface.

This soil is generally in poor tilth. The surface crusts when dry and forms clods if it is worked when wet.

The soil is medium acid to strongly acid in the upper part and medium acid to mildly alkaline in the layer just above bedrock. The clayey subsoil restricts the penetration of most plant roots and the movement of water and air. Runoff is rapid, permeability is moderately slow, and available water capacity is low.

This soil is difficult to work and is highly susceptible to further erosion. These characteristics and the low available water capacity make it poorly suited to row crops. If adequately limed, fertilized, and otherwise well managed, it is suited to small grain, pasture, and hay. Most of the acreage has been cleared. Most areas are idle or in unimproved pasture. A large acreage is reverting to trees, mostly redcedar. Capability unit IVe–3; woodland group 4c3e.

TbC3—Talbott silty clay loam, 5 to 12 percent slopes, severely eroded. This sloping, well-drained soil is on uplands in the Inner Central Basin. Rills, shallow gullies, and a few deep gullies are common. This soil formed in residuum weathered from limestone. The thin surface layer is brown, yellowish-brown, strong-brown, or reddish-brown silty clay loam that consists mostly of material from the clayey subsoil mixed with the remaining original surface layer. The upper 10 to 20 inches of the subsoil is yellowish-red, red, or strong-brown, firm clay or silty clay. Below this, the soil is dominantly yellowish-brown or light olive-brown, firm, plastic clay that is commonly mottled with shades of red, yellow, brown, and gray. In places a few chert fragments are on the surface and throughout the upper 5 to 10 inches of the soil. Limestone bedrock is at a depth of 20 to 40 inches. It is exposed in many of the gullies.

Included with this soil in mapping are a few areas of soils that are more than 40 inches or less than 20 inches deep to bedrock. Also included are inseparable areas of soils that have a few outcrops of limestone on the surface.

This soil is generally in poor tilth. The surface generally crusts when dry and forms clods if it is worked when wet. The soil is medium acid to strongly acid in the surface layer and the upper part of the subsoil and is generally medium acid to mildly alkaline in the layer just above bedrock. In many places where the soil is adjacent to phosphatic soils, it has inherited a medium to high content of phosphorus. In these areas, the subsoil generally is browner than it is where the soil is low in phosphorus. Runoff is rapid, permeability is moderately slow, and available water capacity is low.

This soil is poorly suited to row crops. It is better suited to permanent pasture and hay than to other uses. Liming, fertilizing, and controlling erosion are important. Most of the acreage has been cleared and is used mainly for pasture. Much of the pasture is unimproved, and many areas are idle. Some areas are reverting to trees, mostly redcedar. Capability unit VIe–2; woodland group 4c3e.

TbD3—Talbott silty clay loam, 12 to 20 percent slopes, severely eroded. This moderately steep, well-drained soil is on uplands in the Inner Central Basin. It formed in residuum weathered from limestone. The surface layer is brown, dark yellowish-brown, yellowish-brown, strong-brown, or reddish-brown silty clay loam or silt loam. The upper 10 to 20 inches of the subsoil is yellowish-red, red, or strong-brown, firm clay. Below this, the soil is dominantly yellowish-brown or light olive-brown, firm, plastic clay that is commonly mottled with shades of red, yellow, brown, and gray. Limestone bedrock is at a depth of 20 to 40 inches. In places a few chert fragments are on the surface and in the upper 5 to 10 inches of the soil.

Included with this soil in mapping, and making up about 50 percent of the acreage, are areas of slightly eroded and moderately eroded soils that have a surface layer of brown silt loam 4 to 8 inches thick. Rills, shallow gullies, and a few deep gullies are common in the severely eroded soils. Also included are a few areas of soils that are more than 40 inches or less than 20 inches deep to bedrock. Also included are inseparable areas of soils that have a few outcrops of limestone on the surface.

This soil is generally medium acid to strongly acid in the surface layer and the upper part of the subsoil and commonly medium acid to mildly alkaline in the layer just above bedrock. In many places where the soil is adjacent to phosphatic soils, it has inherited a medium to high content of phosphorus. In these areas the subsoil is generally browner than it is in areas that are low in phosphorus. The severely eroded soils are generally in poor tilth. Runoff is rapid, permeability is moderately slow, and available water capacity is low.

If limed, fertilized, and otherwise well managed, this soil is suited to permanent pasture and hay. It is highly susceptible to erosion. Most severely eroded areas have been cleared. They generally are idle or are used for unimproved pasture. Capability unit VIe–2; woodland group 4c3e.

TrC—Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes. This complex is in the Inner Central Basin. It consists of soils that have a high content of clay and many outcrops of rock. Outcrops of limestone cover 5 to 25 percent of the land surface. About 50 percent of the soil between the outcrops is Talbott soil, and 50 percent is Barfield soil. In most areas these two soils are so intermingled that it is impossible to map them separately, but some areas are dominantly Talbott soil, and others are dominantly Barfield soil. The Talbott soil has a surface layer of brown silt loam and a subsoil of reddish, firm, plastic clay. It ranges from 20 to 40 inches in depth. The Barfield soil is less than 20 inches deep. It has a surface layer of very dark brown silty clay loam and a subsoil of olive, olive-brown, or yellowish-brown, firm, plastic clay.

Included with this complex in mapping are areas of soils that have a surface layer of dark-colored silty clay loam that is 3 to 10 inches deep to bedrock.

The Talbott soil in this complex is medium acid to strongly acid in the upper part and medium acid to mildly alkaline in the lower part. The Barfield soil is slightly acid to mildly alkaline throughout. Runoff is medium to rapid, permeability is moderately slow, and available water capacity is low.

Outcrops of limestone are sufficient to make tillage of row crops impractical, but seedbeds can be prepared for permanent pasture and hay. Mowing and clipping, however, are difficult. Most areas of this complex are highly susceptible to erosion. About half of the acre-

age has been cleared and is used mainly for pasture. A large acreage is idle, and much of the pasture is unimproved. Capability unit VIs–2; woodland group 4x3.

Tupelo Series

The Tupelo series consists of somewhat poorly drained, deep soils. These soils formed in clayey alluvium or in a thin layer of alluvium and in the underlying clay, which formed in material weathered from limestone. They are on stream terraces and toe slopes and in broad, flat depressions in the uplands. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is dark grayish-brown silt loam about 8 inches thick. The upper 7 inches of the subsoil is light olive-brown, friable silty clay loam mottled with shades of yellow and brown; the middle 13 inches is light olive-brown and pale-olive, firm silty clay mottled with shades of yellow, brown, and gray; and the lower 28 inches is mottled, gray, firm clay. Below this is 9 inches of gray, very firm clay. Limestone bedrock is at a depth of 65 inches.

Representative profile of Tupelo silt loam:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine and medium, distinct, light olive-brown mottles; weak, fine, granular structure; friable; common fine roots; common fine and medium, dark-colored concretions; medium acid; abrupt, smooth boundary.

B21t—8 to 15 inches, light olive-brown (2.5Y 5/6) silty clay loam; few, fine, faint, yellowish-brown and strong-brown mottles; moderate, medium, subangular blocky structure; friable; patchy clay films; common fine roots; common fine and medium, dark-colored concretions; strongly acid; clear, wavy boundary.

B22t—15 to 23 inches, light olive-brown (2.5Y 5/4) silty clay; common, fine and medium, distinct, yellowish-red (5YR 4/6), strong-brown (7.5YR 5/6), and light brownish-gray (2.5Y 6/2) mottles; moderate, medium, subangular and angular blocky structure; firm; continuous clay films; few fine roots; common fine and medium, dark-colored concretions; strongly acid; gradual, wavy boundary.

B23t—23 to 28 inches, pale-olive (5Y 6/3) silty clay; many, fine and medium, distinct, dark-brown (7.5YR 4/4), light brownish-gray (2.5Y 6/2), and light olive-brown (2.5Y 5/4) mottles; moderate, fine and medium, angular blocky structure; firm; continuous clay films; few fine roots; common fine and medium, dark-colored concretions; strongly acid; gradual, smooth boundary.

B24tg—28 to 56 inches, gray (N 6/0) clay; many, medium and coarse, distinct, yellowish-brown (10YR 5/6) and dark yellowish-brown (10YR 4/4) mottles; weak, medium, angular blocky structure; firm; continuous clay films; common medium and large, dark-colored concretions; few ¼- to 1-inch chert pebbles; slightly acid; gradual, smooth boundary.

Cg—56 to 65 inches, gray (N 6/0) clay; many, medium and coarse, distinct, yellowish-brown (10YR 5/6) and light olive-brown (2.5Y 5/4) mottles; massive; very firm; many medium and large, dark-colored concretions; few ¼- to 1-inch chert pebbles; slightly acid.

R—65 inches, limestone bedrock.

Depth to limestone bedrock ranges from 40 to about 70 inches. Reaction ranges from medium acid to strongly acid in the A and B horizons and from medium acid to mildly alkaline in the C horizon.

The A horizon is dark grayish-brown, grayish-brown, or brown silt loam or silty clay loam 5 to 10 inches thick. The B1 and B2 horizons are light olive brown, pale olive, light yellowish brown, or yellowish brown and are mottled with shades of gray, yellow, brown, and red. The B1 horizon is silt loam, silty clay loam, or silty clay; the B2 horizon is silty clay loam, silty clay, or clay. The B3 and C horizons are dominantly gray or grayish-brown clay or silty clay that is mottled with shades of yellow, brown, and olive.

Tu—Tupelo silt loam. This nearly level, somewhat poorly drained soil is on stream terraces and toe slopes and in broad, flat depressions in the uplands. It formed in clayey alluvium or partly in alluvium and partly in the underlying clayey residuum weathered from limestone. The surface layer is dark grayish-brown, friable silt loam. The subsoil, to a depth of about 30 inches, is brownish silty clay loam or silty clay that is mottled with shades of gray, yellow, brown, and red. Below this, the soil is dominantly gray, firm silty clay and clay that is mottled with shades of yellow, brown, and gray. Limestone bedrock is at a depth of 40 to about 70 inches.

Included with this soil in mapping are areas of soils that have a surface layer of very dark grayish-brown, very dark gray, or very dark brown silty clay loam 5 to 8 inches thick. Also included are a few areas of soils that are less than 40 inches deep to bedrock, small areas of soils that have a dominantly gray clayey subsoil immediately below the surface layer, and a few areas of soils that are free of gray mottles in the upper 10 to 15 inches of the subsoil.

This soil is medium acid to strongly acid in the upper part and slightly acid to mildly alkaline in the lower part. It is wet in winter and spring and droughty in summer. The clayey subsoil restricts the growth of most plant roots and slows the movement of water and air. Runoff and permeability are slow.

This soil is generally too wet to work until late in spring or early in summer. In undrained areas it is better suited to water-tolerant pasture than to other uses. Where drainage is provided, it can be used intensively for crops. About three-fourths of the acreage has been cleared and is used mainly for pasture. A few areas are used for row crops. Much of the pasture is unimproved, and many areas are idle. Capability unit IIIw–2; woodland group 3w8.

Woodmont Series

The Woodmont series consists of somewhat poorly drained, deep soils that have a fragipan at a depth of 20 to 36 inches. These soils formed in 4 to 6 feet of old silty alluvium or mixed alluvium and loess and are underlain in most places by clayey residuum weathered from limestone. They are on upland flats and stream terraces and in depressions. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is dark grayish-brown silt loam about 8 inches thick. The subsoil, to a depth of about 23 inches, is light yellowish-brown and yellowish-brown, friable silt loam mottled with gray and brown in the lower 12 inches. Below this, to a depth of about 62 inches or more, is a very firm, dense and brittle fragipan of mottled light-gray and light brownish-gray silt loam and silty clay loam.

Representative profile of Woodmont silt loam:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) silt loam; common, fine and medium, distinct, light yellowish-brown (10YR 6/4) mottles; weak, fine, granular structure; very friable; many fine roots; few fine and medium, dark-colored concretions; few ¼- to 1-inch chert pebbles; medium acid; abrupt, smooth boundary.

B1—8 to 11 inches, light yellowish-brown (10YR 6/4) silt loam; few, fine and medium, distinct, dark grayish-brown (10YR 4/2) mottles; weak, medium, subangular blocky structure; friable; common fine roots; common fine and medium, dark-colored concretions; few small chert pebbles; strongly acid; clear, smooth boundary.

B2—11 to 23 inches, yellowish-brown (10YR 5/6) silt loam; common, fine and medium, distinct, light-gray (10YR 7/1) and light brownish-gray (2.5Y 6/2) mottles; moderate, medium, subangular blocky structure; friable; common fine roots; common fine and medium, dark-colored concretions; strongly acid; clear, wavy boundary.

A'2&B'x1—23 to 26 inches, mottled light yellowish-brown (2.5Y 6/4), strong-brown (7.5YR 5/6), and light brownish-gray (2.5Y 6/2) silt loam; peds thickly coated with light-gray (10YR 7/1) silt loam; weak, medium, platy structure; friable; slightly brittle; few fine roots in gray part; common small and medium, dark-brown concretions; strongly acid; clear, wavy boundary.

B'x2—26 to 35 inches, light-gray (10YR 7/1) silt loam; common, fine and medium, distinct, light yellowish-brown (2.5Y 6/4) and yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to moderate, medium, angular blocky; veins of grayish silt and clay; firm and brittle in more than 75 percent of the cross-section; patchy clay films; few fine, dark-colored concretions; strongly acid; gradual, wavy boundary.

B'x3—35 to 45 inches, light-gray (2.5Y 7/2) silty clay loam; common, fine to coarse, distinct, yellowish-brown (10YR 5/6) and light yellowish-brown (2.5Y 6/4) mottles; weak, coarse, prismatic structure parting to weak, medium, angular blocky and some evidence of platiness; veins and pockets of grayish silt and clay; firm and brittle in more than 75 percent of the cross-section; patchy clay films; common medium, dark-colored concretions; few small chert pebbles; slightly acid; gradual, wavy boundary.

B'x4—45 to 62 inches, light brownish-gray (10YR 6/2) silty clay loam; common, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, medium, angular blocky; firm and brittle in more than 75 percent of the cross-section; some veins and pockets of grayish silt and clay; patchy clay films; many medium and large, dark-colored concretions; neutral.

Depth to the fragipan ranges from about 20 to 36 inches. In places the fragipan is underlain at a depth of 48 to 60 inches by clayey residuum weathered from limestone that extends to bedrock. Reaction is strongly acid above the fragipan and strongly acid to mildly alkaline in the fragipan.

The A horizon is dark grayish brown, brown, or grayish brown and ranges from 5 to 10 inches thick. The B1 and B2 horizons are yellowish brown, light yellowish brown, or light olive brown and have distinct gray mottles within 16 inches of the surface. In most places the A'x2 horizon is thin and difficult to distinguish from the B'x horizon. The fragipan either is dominantly gray and light gray and mottled with shades of yellow and brown or is evenly mottled with shades of gray, yellow, and brown.

Wo—Woodmont silt loam. This nearly level, somewhat poorly drained soil is on upland flats and stream terraces and in depressions. It has a fragipan at a depth of 20 to 36 inches. It formed in 4 to 6 feet of old silty alluvium or mixed alluvium and loess and is underlain in most places by clayey residuum weathered from limestone. The surface layer is dark grayish-brown, brown, or grayish-brown silt loam. The subsoil above the fragipan is light yellowish-brown, light olive-brown, or yellowish-brown, friable silt loam that is mottled with gray in at least the lower 10 inches. The fragipan is dominantly gray, firm, brittle silt loam or silty clay loam that is mottled with shades of yellow and brown.

Included with this soil in mapping are a few areas of poorly drained soils and a few areas of moderately well drained soils that have a fragipan. Also included are a few areas of somewhat poorly drained soils that are underlain by clayey residuum weathered from limestone at a depth of 24 to 48 inches.

This soil is strongly acid above the fragipan and strongly acid to mildly alkaline in the fragipan. Roots, water, and air easily penetrate the soil above the fragipan. A perched water table above the dense, compact, slowly permeable fragipan keeps the soil saturated for long periods in winter and spring. Runoff is slow, and ponding is common in many places.

This soil is wet in winter and spring and droughty in summer. After it dries out, it is easy to work. Where drained, limed, and fertilized, the soil can be used intensively. It is poorly suited to most deep-rooted plants. About 85 percent of the acreage has been cleared and is used mainly for crops and pasture. Capability unit IIIw–2; woodland group 3w8.

Use of the Soils for Crops and Pasture [3]

The soils of Rutherford County are used mainly for farming. The largest acreages are used for pasture and hay, and relatively small acreages of corn, small grain, cotton, soybeans, and tobacco are grown. On the following pages, the capability grouping used by the Soil Conservation Service is explained, management by capability unit is described, and estimated yields of the principal crops grown in the county are given.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when they are used for field crops, the risk of damage when they are used in this way, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a

[3] C. H. JENT, agronomist, Soil Conservation Service, helped prepare this section.

substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, all kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. These groups are described in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife habitat. (No Class V soils in Rutherford County.)

Class VI soils have severe limitations that make them generally unsuited to cultivation and that limit their use largely to pasture, range, woodland, or wildlife habitat.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture, range, woodland, or wildlife habitat.

Class VIII soils and landforms have limitations that preclude their use for commercial crop production and that restrict their use to recreation, wildlife habitat, or water supply or to esthetic purposes. (No Class VIII soils in Rutherford County.)

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils, the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In Class I there are no subclasses because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c* because the soils in Class V are subject to little or no erosion, although they have other limitations that restrict their use largely to pasture, range, woodland, wildlife habitat, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe- or IIIe-4. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation; and the Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

Suggestions for the use and management of the soils of Rutherford County by capability unit are given in the following pages. Specific statements are not made concerning the use of fertilizer, desirable varieties and mixtures of seeds, or favorable dates for planting. Up-to-date information is published from time to time by the University of Tennessee Agricultural Experiment Station and by the Extension Service of the United States Department of Agriculture. Personnel of the local office of the Soil Conservation Service and the Extension Service can furnish information helpful in interpreting this information.

The capability unit designation for each soil in the survey area is given in the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I-1

This unit consists of nearly level, deep, well-drained soils. These soils have a thick surface layer of very friable silt loam and a subsoil of friable silt loam or silty clay loam. Roots penetrate to a depth of 4 feet or more. A few areas are likely to be flooded or ponded occasionally for brief periods. Available water capacity is high, fertility is moderate to high, and response to management is excellent.

These soils are well suited to crops and can be farmed intensively. They are easy to work, and all the common crops are easily grown. Tobacco and alfalfa grow well on these soils, but there is moderate risk of damage from brief flooding or ponding and sedimentation in a few places. The soils are highly productive of pasture, especially supplemental summer pasture.

Because the soils in this unit are nearly level and not subject to erosion, they can be used for crops every year. Good tilth can be maintained if the soils are not tilled or grazed too wet and the supply of organic matter is replenished by plowing under large amounts of residue. Crops respond well to fertilizer.

CAPABILITY UNIT I-2

This unit consists of nearly level, deep, well-drained soils on uplands. These soils have a thick surface layer of friable silt loam and a clayey subsoil that is easily penetrated by plant roots, water, and air. Available water capacity is medium to high, fertility is moderate, and response to management is excellent.

These soils are well suited to the commonly grown crops. They are easy to work and can be farmed intensively. They are also well suited to pasture.

Row crops can be grown on these soils every year, but green-manure crops or crop residues are needed to replenish the supply of organic matter. Crops re-

spond well to lime and fertilizer. Good tilth can be maintained if the soils are not tilled or grazed when too wet. Although erosion is not a hazard in most places, diversions are needed in a few places to protect the soils against excess runoff from steeper adjoining soils.

CAPABILITY UNIT IIe–1

This unit consists of gently sloping, deep, well-drained soils on stream terraces, uplands, and toe slopes. These soils have a surface layer of friable silt loam and a subsoil of friable silt loam, silty clay loam, or clay loam. The root zone is thick and is easily penetrated by plant roots, water, and air. Available water capacity is high, fertility is moderate to high, and response to management is good.

These soils are among the best in the county for farming. If adequately limed, fertilized, and otherwise well managed, they are suited to all crops and forage plants commonly grown (fig. 19). Row crops can be grown as much as 50 percent of the time but should not be grown more than 2 years in succession.

Erosion is the main hazard. It can be reduced by using a suitable cropping system and contour cultivation. On long slopes, erosion can be controlled by terraces or contour stripcropping. Diversions can be used on many areas that receive excess runoff from steeper adjoining soils. In most places natural draws provide excellent sites for sod waterways that serve as outlets from terraces or diversions. Planting winter cover crops and plowing under large amounts of residue are needed to maintain good tilth and replenish the supply of organic matter.

Figure 19.—**Supplemental pasture on Lomond silt loam, 2 to 5 percent slopes, in capability unit IIe–1.**

CAPABILITY UNIT IIe–2

This unit consists of gently sloping and nearly level, deep and moderately deep, well-drained soils on uplands. These soils have a surface layer of friable silt loam and a clayey subsoil. The clayey subsoil restricts the movement of water and air. Most plant roots, however, penetrate the subsoil readily. Available water capacity is mainly medium to high, fertility is moderate, and response to management is good.

These soils are well suited to most commonly grown crops and pasture plants and are suitable for moderately intensive use. If adequately limed, fertilized, and otherwise well managed, row crops can be grown as much as 50 percent of the time (fig. 20). A suitable cropping system is one in which a row crop is grown no more than 2 years in succession and is followed by 2 years or more of grasses and legumes.

Controlling erosion on the gently sloping soils is the main concern of management. A suitable cropping system, contour cultivation, contour stripcropping, and terraces help control erosion. Winter cover crops, green-manure crops, and plowing under large amounts of residue are needed to maintain good tilth and

Figure 20.—**Liming a Cumberland soil before seeding pasture.**

replenish the supply of organic matter. Good tilth can be maintained if the soils are not tilled or grazed when too wet. Diversions can be used on many areas that receive excess runoff from steeper adjoining soils. In most places natural draws provide excellent sites for sod waterways that serve as outlets from terraces or diversions.

CAPABILITY UNIT IIe–3

This unit consists of gently sloping, moderately well drained soils on uplands and stream terraces. These soils have a surface layer of friable silt loam and a dense, slowly permeable subsoil. Some of these soils have a slowly permeable clayey subsoil, and some have a subsoil of silty clay loam that includes a fragipan at a depth of about 2 feet. The root zone of most plants is restricted to the upper 18 to 30 inches of the soil. During heavy rainfall the subsoil is waterlogged. During prolonged dry periods the soils dry out, and most crops and pasture plants are damaged.

These soils are easy to work, and response to management is good. If fertilized and otherwise well managed, they are suitable for moderately intensive use. A suitable cropping system is one in which row crops are grown as much as 50 percent of the time but no more than 2 years in succession and are followed by 2 years or more of pasture or hay. The selection of water- and drought-resistant plants is important. Most deep-rooted legumes, such as alfalfa, ordinarily do not last more than 2 or 3 years. Corn, soybeans, and small grain are suited. Tobacco is only fairly well suited because of periodic wetness.

The selection of suitable plants, a suitable cropping system, applying fertilizer, and controlling erosion are important in the management of these soils. Contour cultivation, terraces, contour stripcropping, residue management, and cover crops are all effective in controlling erosion. Diversions and sod waterways can be used in many places to remove excess runoff. Plowing under winter cover crops and large amounts of crop residue helps to maintain good tilth and to replenish the supply of organic matter. Carefully controlled grazing, especially during wet periods, prevents damage from trampling.

CAPABILITY UNIT IIs–1

This unit consists only of Cannon cherty silt loam. This is a deep, well-drained cherty soil on first bottoms along streams and small drainageways and in depressions. The upper 2 to 4 feet of this soil is friable cherty silt loam. Most of this soil is likely to be flooded occasionally for short periods. It can be tilled throughout a wide range of moisture content. Chert fragments, however, interfere with tillage and reduce the available water capacity to medium. The root zone is thick and is easily penetrated by plant roots, water, and air. Fertility is high, and response to management is good.

This soil is suited to most commonly grown crops and pasture plants. If the soil is fertilized and otherwise well managed, row crops can be grown every year. Tobacco and alfalfa can be grown in fields that are not likely to be flooded. The soil is well suited to pasture, especially supplemental summer pasture using warm-season annuals.

Damage from flooding and sedimentation can be reduced in many places by realigning, clearing, and snagging the stream channels. Diversions that have vegetated outlets are needed in places to protect the soil against runoff from adjacent uplands.

CAPABILITY UNIT IIw–1

The unit consists of nearly level, moderately well drained soils on stream terraces and uplands. These soils have a surface layer of friable silt loam and a dense, slowly permeable subsoil. Some of these soils have a slowly permeable clayey subsoil, and some have a loamy subsoil and a fragipan at a depth of about 2 feet. The root zone of most plants is restricted to the upper 20 to 24 inches of the soil. During heavy rainfall the subsoil is waterlogged. During prolonged dry periods the soils dry out, and most crops and pasture plants are damaged.

The surface layer of these soils is easy to work, and response to management is good. These soils can be used for row crops every year if they are adequately fertilized and otherwise well managed, but they may be better suited to a short cropping system. They are especially well suited to a rotation of corn followed by an annual hay crop. They are also suited to soybeans. They are poorly suited to alfalfa and tobacco because of seasonal wetness just above the fragipan or clayey subsoil. Tall fescue, common bermudagrass, midland bermudagrass, white clover, and annual lespedeza are suitable pasture crops. Supplemental summer pasture can be grown, but it is sometimes affected by drought.

Wetness in spring delays tillage in many places. Open ditches provide effective drainage in areas where outlets are available. Tile drains are not generally successful because of slow permeability. Removing excess water, plowing under crop residue to preserve tilth and help maintain organic matter, delaying tillage and protecting pasture from trampling when the soils are wet, and selecting the most water-tolerant and drought-tolerant plants are all important management practices.

CAPABILITY UNIT IIw–2

This unit consists of moderately well drained soils on bottom lands. They have a thick loamy surface layer. In most areas surface drainage is slow, and some areas are flooded or ponded occasionally for a few hours at a time. Available water capacity is high. Reaction is medium acid to neutral. No lime is needed.

These soils are well suited to soybeans, tall fescue, white clover, and lespedeza. They are well suited to supplemental summer pasture, but they are too wet and too soft to be grazed for long periods in winter and spring. Corn grows well, but it should be planted slightly later on these soils than on well-drained soils. Small grain and alfalfa can be grown in areas where surface drainage is good and ponding or flooding is not severe.

These soils are suitable for row crops every year because they are nearly level and are not subject to erosion. In many places a system of open drainage

ditches and diversion ditches improves surface and internal drainage. Plowing under large amounts of crop residue replenishes the supply of organic matter and preserves tilth.

CAPABILITY UNIT IIIe-1

This unit consists of sloping, deep, friable, well-drained loamy soils on uplands and terraces. These soils are easily penetrated by air, water, and roots. The surface layer is easy to work. Available water capacity is high. The response to management is good.

If fertilized and otherwise well managed, these soils are suited to many crops, including corn, tobacco, small grain, lespedeza, white clover, alfalfa, orchardgrass, and tall fescue. They are well suited to most vegetable crops. A suitable cropping system is one in which a row crop is followed by a small grain, then pasture or hay for 2 years or more or one in which a row crop is followed by alfalfa for 4 years. These rotations work well in stripcropping.

Controlling erosion is the main concern of management. A suitable cropping system, adequate fertilization, and good management are needed. Vetch, crimson clover, and small grain are effective winter cover and green-manure crops because they replenish the supply of organic matter and protect the soils against erosion. Plowing under crop residue helps control erosion and preserve tilth. Diversions, stripcropping, no-tillage and minimum tillage practices, terraces, and contour cultivation are all effective in controlling erosion. In many places natural draws provide excellent sites for sod waterways that serve as outlets for terraces or diversions.

CAPABILITY UNIT IIIe-2

This unit consists of gently sloping and sloping, deep, well-drained soils on uplands. These soils have a subsoil of silty clay or clay that is fairly easily penetrated by plant roots. About two-thirds of these soils are severely eroded and have a surface layer of silty clay loam. The moderately eroded soils have a surface layer of friable silt loam 4 to 8 inches thick. Available water capacity is medium to high. The response to management is good.

These soils are suited to all commonly grown crops and pasture plants. The severely eroded soils are somewhat difficult to work and to keep in good tilth. If the soils are limed, fertilized, and otherwise well managed, a row crop can be grown once every 3 or 4 years. A suitable cropping system is a row crop followed by small grain, then pasture or hay for 2 years or more.

Controlling erosion and maintaining or improving tilth are the main concerns of management. The tilth of the severely eroded soils can be improved by not tilling when too wet, by seeding and fertilizing at high rates, by growing winter cover and green-manure crops, and by plowing under large amounts of crop residue. A suitable cropping system, no-tillage and minimum tillage practices, contour cultivation, terraces, diversions, and contour stripcropping are effective in controlling erosion. In most places natural draws provide excellent sites for sod waterways that serve as outlets for terraces or diversions.

CAPABILITY UNIT IIIe-3

This unit consists of gently sloping, deep and moderately deep, well-drained soils on uplands. These soils have a surface layer of friable silt loam and a clayey subsoil. Water enters and moves through these soils slowly. Runoff is medium to rapid, available water capacity is medium to low, and drought is a frequent limitation.

Although these soils are fairly well suited to most crops commonly grown, they are better suited to small grain, hay, and pasture. The clayey subsoil limits the root zone of many plants, and water is held tightly and is not readily available to plants. A suitable cropping system is a row crop followed by small grain and then 2 years or more of pasture or hay.

These soils are highly susceptible to erosion, especially where row crops are grown. Therefore, controlling erosion is a major concern of management. Contour cultivation, terraces, stripcropping, and diversions are effective in controlling erosion. Winter cover crops after each season of row crops, green-manure crops, and plowing under large amounts of crop residue help to maintain good tilth and to replenish the supply of organic matter in these soils.

CAPABILITY UNIT IIIw-1

This unit consists of somewhat poorly drained and poorly drained soils on first bottoms. Most of these soils have a thick surface layer of silty clay loam or silty clay and a clayey, mottled subsoil. Most areas are likely to be flooded occasionally. The soils are kept saturated by flooding, ponding, or a water table that remains near the surface for long periods.

If adequately drained, these soils can be used for row crops every year. Under natural drainage, crop failure is common. The soils are so wet that tillage in spring and harvest in fall are often delayed. The soils are suited to pasture. They are especially valuable for supplemental summer pasture because they generally remain moist during dry parts of the growing season. They are poorly suited to most deep-rooted legumes, such as alfalfa.

Wetness is the main limitation. Where suitable outlets are available, open drainage ditches can be used to remove surface water from ponded areas. Tile drains are not effective in most of these soils because of slow internal movement of water. Most of the soils must be tilled within a narrow range of moisture content to maintain good tilth. If tilled when too wet, the soils either puddle or hard clods form when the soils dry. Selecting crops and pasture plants that tolerate wetness and carefully controlling grazing to prevent damage from trampling are important in the management of these soils.

CAPABILITY UNIT IIIw-2

This unit consists of nearly level, somewhat poorly drained soils on stream terraces and broad flats in the uplands. These soils have a surface layer of friable silt loam. They have a fragipan or a subsoil of plastic clay and are slowly permeable and poorly aerated. Growth of plant roots is restricted to the upper 1 foot or 2 feet. The surface layer of these soils is easy to work, but

the soils are saturated in winter and spring. In places they are ponded, and in summer and fall they generally dry out and are droughty.

Under natural drainage, crop failures or reduced yields are fairly common. Under supplemental drainage, corn, soybeans, and sorghum are suited. Small grain is suited only if surface water is removed. Tall fescue, common bermudagrass, white clover, and annual lespedeza are suitable hay and pasture plants. The soils are poorly suited to deep-rooted legumes, such as alfalfa. They are easily damaged by overgrazing when they are dry and by trampling when they are wet.

Wetness is the main limitation. It often delays tillage in spring and harvest in fall. It can be overcome by selecting crops that can be planted late, such as soybeans, and crops that tolerate wetness, such as tall fescue. Open ditches to remove surface water from pockets and low areas where suitable outlets are available are also beneficial. Tile drains generally are not effective because of slow internal water movement. Row crops can be grown every year because these soils are nearly level and are not likely to erode. Large amounts of fertilizer should be applied, and stalks and stubble should be plowed under to replenish the supply of organic matter and to preserve tilth.

CAPABILITY UNIT IVe-1

This unit consists only of Stiversville silt loam, 12 to 20 percent slopes. This is a moderately steep, well-drained loamy soil. It has a thick root zone that is easily penetrated by plant roots, water, and air. The subsoil contains considerable fine sand, and the lower part of the soil commonly contains fragments of weathered sandy limestone. The soil is medium acid or strongly acid throughout. It is medium or high in content of phosphorus. Available water capacity is medium. The response to management is good.

This soil is suited to all commonly grown crops and pasture plants. If the soil is limed, fertilized, and otherwise well managed, a row crop can be grown occasionally. A suitable cropping system is a row crop one-fourth of the time and grass and legumes three-fourths of the time.

Water management to control and reduce erosion is important. Contour cultivation, no-tillage and minimum tillage practices, stripcropping, and diversions are effective in reducing runoff and erosion. Natural draws, seeded or left in sod, provide good drainage outlets. Although the soil is easy to work and good tilth is not difficult to maintain, each row crop should be followed by a winter cover crop and large amounts of crop residue should be plowed under to replenish the supply of organic matter and to preserve tilth.

CAPABILITY UNIT IVe-2

This unit consists of sloping, severely eroded, well-drained soils on uplands. These soils have a surface layer of silty clay loam and a subsoil of silty clay or clay. The surface layer is sticky when wet and hard and cloddy when dry. In many places there are small areas of soils that have a few outcrops of limestone. Available water capacity is medium. The soils respond well to management, but lack of moisture generally reduces yields of most crops in summer.

Most row crops can be grown occasionally if the soils are limed, fertilized, and carefully managed. Small grain is better suited because it grows and matures when moisture is generally plentiful. Row crops should be planted only once every 4 to 6 years. A suitable cropping system is a row crop followed by small grain and then sod for 3 years or more.

The hazard of erosion is severe on these soils. It can be reduced by a suitable cropping system, contour cultivation, no-tillage and minimum tillage practices, contour stripcropping, and terraces or diversions. Natural draws, seeded or left in sod, provide good sites for sod waterways. Tilth of the soils can be improved by not tilling when too wet, by seeding and fertilizing at high rates to insure good stands and growth, by growing winter cover and green-manure crops, and by plowing under large amounts of crop residue.

CAPABILITY UNIT IVe-3

This unit consists of moderately deep and deep, well-drained soils on uplands. Slopes range from 2 to 12 percent. These soils have a surface layer of silt loam or silty clay loam and a clayey subsoil. In places the surface layer is cherty or flaggy. In many places there are small areas of soils that have a few outcrops of limestone. Most of these soils are medium to high in content of phosphorus. Available water capacity is medium to low. Medium or rapid runoff and moderately slow to slow permeability make the soils highly susceptible to erosion.

These soils are moderately well suited to most crops and well suited to most commonly grown pasture plants. Most summer crops are damaged by drought because water is held tightly by the clayey subsoil and is not readily available to plants. Most deep-rooted legumes, such as alfalfa, are difficult to establish and maintain. Small grain grows well because moisture is adequate during the growing season. Row crops should be planted only once every 4 to 6 years. A suitable cropping system is a row crop followed by small grain and then sod for 3 years or more.

Because of the slope and the clayey subsoil, these soils are difficult to manage. They are highly susceptible to erosion, and pasture is easily damaged by overgrazing. A suitable cropping system, contour cultivation, contour stripcropping, terraces, and diversions are effective in controlling erosion. In most places it is difficult to construct and maintain terraces and diversions because of the plastic, clayey subsoil and the moderate depth to bedrock in some of the soils. Tilth of the severely eroded soils can be improved by not tilling when too wet and by plowing under green-manure crops. Winter cover crops following row crops and plowing under large amounts of crop residue are needed to help control erosion and replenish the supply of organic matter.

CAPABILITY UNIT IVs-1

This unit consists of well-drained cherty and gravelly soils on uplands and high stream terraces. Slopes range from 2 to 15 percent. These soils have a

surface layer of cherty or gravelly silt loam and a very cherty or very gravelly subsoil. Chert or gravel on the surface and throughout the soils interferes with tillage and causes the soils to be droughty. Available water capacity is low.

These soils are poorly suited to crops that require frequent tillage. If adequately limed, fertilized, and otherwise well managed, they are suited to small grain and forage crops. Most hay crops and pasture plants can be grown, but growth is generally slow in summer and fall because of drought. Row crops should be grown only once every 4 to 6 years if at all.

The selection of crops that require little or no tillage and adequate liming and fertilizing are important in the management of these soils. Erosion is a hazard. Contour cultivation, terraces, and diversions are effective in controlling erosion. In places it is difficult to construct and maintain terraces and diversions because of the high content of gravel and coarse chert fragments. Carefully controlled grazing is important to prevent damage from overgrazing, especially during dry periods.

CAPABILITY UNIT IVs–2

This unit consists only of Bradyville-Rock outcrop complex, 0 to 2 percent slopes. Slopes are 0 to 2 percent. Outcrops of limestone cover 5 to 25 percent of the land surface and are nearly level with or only a few inches higher than the soil surface. The soil between the rocks has a surface layer of silt loam and a friable clayey subsoil that is easily penetrated by plant roots, air, and water.

This land is suited to small grain, hay, and pasture plants. It is not so well suited to row crops, such as corn, that require cultivating equipment. Because the rocks do not extend high above the surface, fields can be driven over by vehicles and farm machinery, but the rocks interfere seriously with cultivation.

Erosion is only a slight hazard. The selection of suitable plants, adequate liming and fertilization, and controlled grazing are important in management.

CAPABILITY UNIT IVw–1

This unit consists of nearly level, poorly drained soils on stream terraces and broad upland flats. These soils have a surface layer of friable silt loam and a fragipan or a clayey subsoil. They are slowly permeable, have slow runoff, and in many places are ponded for long periods. They are generally saturated in winter and spring and are extremely dry during prolonged dry periods in summer and fall. If they contain the proper amount of moisture, they are easily worked. In many places, however, waterlogging delays or prevents harvesting and the use of heavy machinery.

Under natural drainage, most areas of these soils are poorly suited to row crops. If the soils are adequately drained, crops that are planted late in spring and harvested early in fall can be grown almost every year. The soils are suited to water-tolerant permanent pasture, such as tall fescue. They are poorly suited to deep-rooted legumes, such as alfalfa.

Wetness is the main limitation. Removal of excess water is the main concern of management. Excess surface water can be removed by open ditches where suitable outlets are available. Tile drains are not effective because of slow internal movement of water. The selection of suitable crops and pasture plants, adequate liming and fertilizing, and controlled grazing to prevent damage from trampling when the soils are wet and from overgrazing when they are dry are important in management of these soils.

CAPABILITY UNIT VIe–1

This unit consists of moderately steep and steep, deep, well-drained soils on uplands. These soils have a surface layer of silt loam and a subsoil of friable silty clay loam or clay loam. Some of the soils are cherty. All are medium to high in content of phosphorus. The root zone is thick and is easily penetrated by plant roots, water, and air. Available water capacity is medium.

Because slopes are strong and erosion is a hazard, these soils are poorly suited to crops that require tillage. They are well suited to permanent pasture and hay. If the soils are adequately limed and fertilized, all common grasses and legumes can be grown.

Erosion is the main concern of management. Controlling runoff is effective in reducing erosion. A grass-legume mixture provides better protection than a legume alone. The soils should be plowed only to reseed pasture or hay. Establishing or renovating pasture or hay in alternate contour strips helps reduce erosion. Because black locust and other woody plants naturally reforest these soils, brush and weed control is especially important in pasture management.

CAPABILITY UNIT VIe–2

This unit consists mostly of nearly level to steep, moderately deep and deep, well-drained soils on uplands. These soils have a clayey subsoil. Some of the soils are cherty, some are flaggy, and some are severely eroded. The surface layer of most is thin and commonly contains some material from the subsoil. There are a few outcrops of limestone on most of the soils. Runoff is medium to rapid, permeability is moderate to slow, and available water capacity is low to medium.

These soils are poorly suited to crops that require tillage. Most of the soils are better suited to permanent pasture, hay, and trees. If adequately limed, fertilized, and otherwise well managed, they are suited to most commonly grown hay and pasture plants. Growth is generally rapid in spring, but it is slow in summer and fall because of drought. Selected crops can be grown occasionally on some of the more gently sloping soils, but special practices and careful management are needed to control erosion. A suitable cropping system on these areas is small grain followed by sod or a hay crop for 6 years or more.

Ordinarily, it is difficult to prepare a good seedbed and to establish and maintain a good stand. Chert or flags on the surface and, in places, outcrops of rock interfere with tillage. Tillage within a narrow range of moisture content is important, especially on the severely eroded soils, because hard clods form if the soils are tilled when too wet. These soils are highly susceptible to erosion. Establishing and renovating

Figure 21.—**Permanent pasture on Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes.**

pasture or hay in alternate contour strips helps control erosion. Many critical areas can be protected from excess runoff by diversions. Controlled grazing is important in pasture management, especially during dry periods.

CAPABILITY UNIT VIs-1

This unit consists of moderately steep, deep, well-drained and excessively drained channery and gravelly soils on uplands and high stream terraces. These soils have a surface layer of channery loam or gravelly silt loam. They are strongly acid to slightly acid and have low available water capacity. Gravel or coarse fragments of sandy limestone on the surface and throughout these soils makes them difficult to till.

These soils are poorly suited to crops that require frequent tillage. Selected crops, such as small grain, can be grown occasionally, but it is difficult to prepare a good seedbed and to establish a good stand. The soils are suited to all commonly grown hay and pasture plants. Crops respond well to lime and fertilizer. Growth is generally rapid in spring, but it is slow in summer and fall because of drought.

These soils are susceptible to erosion. Contour stripcropping and establishing or renovating pasture or hay in alternate contour strips help control erosion. Diversions can be used in most places to divert or retard excess runoff. Weed and brush control and carefully controlled grazing during dry periods are important in pasture management.

CAPABILITY UNIT VIs-2

This unit consists of deep to shallow soils that have a dominantly clayey subsoil and outcrops of limestone rock that cover 5 to 25 percent of the land surface. Most of these soils have low available water capacity and are slowly permeable. Runoff is rapid on the steeper slopes.

Shallowness, outcrops of rock, the clayey subsoil, or a combination of these make these soils unsuited to crops that require tillage. Their suitability for pasture and hay varies greatly, and woodland is a better use for many areas. Under good management, the deeper and more fertile soils are suited to forage crops (fig. 21). Growth is generally fast in spring but slow in summer and fall because of drought. Most of the soils in this unit are poorly suited to deep-rooted legumes, such as alfalfa. Alfalfa grows well on a few of the soils, but outcrops of rock make seedbed preparation and mowing difficult.

Most of these soils are highly susceptible to erosion, and they should be plowed or disked only to prepare

a seedbed for reestablishment of pasture. Seeding long slopes in alternate contour strips helps control erosion. Mowing to control weeds and applying lime and fertilizer are desirable, but machinery is difficult to operate in most areas because of the outcrops of rock. Carefully controlled grazing is important to prevent damage from overgrazing, especially during dry periods.

CAPABILITY UNIT VIIs-1

This unit consists of steep soils on hillsides. These soils have many outcrops of bedrock or large amounts of loose fragments of rock on the surface and throughout the soil. Some areas are deeply cut by gullies.

These soils are mostly in forest. Cleared areas should be reforested. Facts about use of these soils for trees can be found in the section "Use of the Soils for Woodland."

Estimated Yields

Table 4 lists estimated yields of the principal crops grown in Rutherford County. Yields are shown for two levels of management. The yields in columns A are expected under common, or prevailing, management; those in columns B are expected under the improved management defined below. Under prevailing management, yields generally are 30 to 40 percent lower than those obtained under improved management. Estimates are not listed if the soil ordinarily is not planted to the crop or is not suited to it.

The estimates in columns B are based on yield data obtained through long-term experiments; on records of crop yields harvested on farms that cooperated in a study of soil productivity and management; and on information obtained from agronomists and soil scientists who have had experience with the crops and soils in the county.

Data for yields obtained from experimental plots were adjusted to reflect the combined effect of slope, weather, and level of management. If such data were not available, estimates were made by using data for similar soils. The estimates are averages of long-term annual yields obtained from nonirrigated crops. The overflow hazard of soils on bottom lands was not considered because the effects of flooding vary locally.

The management needed to obtain yields similar to those listed in columns B of table 4 is assumed to include the following practices:

1. Applying fertilizer according to the needs indicated by soil tests and by past cropping and fertilization practices. This refers especially to needs for phosphorus, potassium, calcium, and minor elements.
2. Selecting high-yielding varieties of crops suited to the soil.
3. Preparing an adequate seedbed.
4. Planting or seeding by suitable methods at an approximate rate and at the right time.
5. Inoculating legumes.
6. Using shallow cultivation for row crops.
7. Controlling weeds, insects, and diseases.
8. Using the cropping systems suggested in the section on management by capability units.
9. Conserving soil and water by establishing waterways, cultivating on the contour, terracing, or contour stripcropping.
10. Regulating grazing.

The rates of planting and fertilization needed to obtain yields equal to the estimates in columns B of table 4 are shown, by crops, in the following paragraphs.

Corn.—Three sets of practices are given for three different levels of estimated productivity. Soils that yield 100 bushels or more per acre, as shown in columns B of table 4, are excellent for corn. The practices that result in such yields are planting for a stand of 16,000 to 18,000 plants per acre and applying about 120 pounds of nitrogen, 50 to 100 pounds of phosphate (P_2O_5), and 50 to 100 pounds of potash (K_2O) per acre.

Soils that yield 80 to 100 bushels per acre are good for corn. Practices upon which such estimates are based are planting for a stand of 12,000 to 14,000 plants per acre and applying about 90 pounds of nitrogen, 40 to 80 pounds of phosphate (P_2O_5), and 40 to 80 pounds of potash (K_2O) per acre.

Soils that yield 50 to 80 bushels per acre are fair for corn. The practices that result in such yields are planting for a stand of 8,000 to 10,000 plants per acre and applying about 60 pounds of nitrogen, 30 to 60 pounds of phosphate (P_2O_5), and 30 to 60 pounds of potash (K_2O) per acre.

Soils that have an estimated potential of less than 40 bushels per acre under good management are poorly suited to corn and can be used more profitably for other crops.

Cotton.—Practices on which estimates in columns B are based are spacing rows 38 to 40 inches apart; thinning the number of plants to between 20,000 and 60,000 per acre, without skips; and applying about 70 pounds of nitrogen, 60 to 90 pounds of phosphate (P_2O_5), and 60 to 90 pounds of potash (K_2O) per acre. Soils that yield less than 1 bale per acre under good management are poorly suited to cotton and can be used to better advantage for other crops.

Burley tobacco.—Practices on which estimates in columns B are based are planting at the rate of 8,500 to 10,000 plants per acre; applying 100 to 120 pounds of nitrogen, 90 to 150 pounds of phosphate (P_2O_5), and 120 to 240 pounds of potash (K_2O) per acre; and applying barnyard manure and growing a leguminous green-manure crop annually. Soils subject to flooding should not be used for burley tobacco. Also, animal manure should be limited to 10 tons per acre.

Wheat.—Practices on which estimates for wheat are based are applying 15 to 30 pounds of nitrogen, 40 to 80 pounds of phosphate (P_2O_5), and 0 to 40 pounds of potash (K_2O) per acre at seeding time and applying about 30 pounds of nitrogen per acre as a topdressing in spring.

Lespedeza.—Practices on which estimates for lespedeza are based are applying 20 to 40 pounds of phosphate (P_2O_5) and 20 to 40 pounds of potash (K_2O) per acre at seeding time. Lespedeza overseeded on small grain requires about twice the amount of phosphate and potash as lespedeza seeded alone. In addition, 15 to 30 pounds of nitrogen should be applied

as a topdressing early in spring where lespedeza is overseeded on small grain. Heavy applications of nitrogen in spring tend to reduce the stand of lespedeza.

Pasture.—Practices on which estimates in column B are based are, during establishment, liming to a pH of 6.1 to 7.0 and applying 25 to 30 pounds of nitrogen, 60 to 120 pounds of phosphate (P_2O_5), and 60 to 120 pounds of potash (K_2O) per acre. During maintenance, the practices are liming as needed to keep the pH between 6.1 to 7.0; applying 0 to 60 pounds of nitrogen, 30 to 60 pounds of phosphate (P_2O_5), and 30 to 60 pounds of potash (K_2O) per acre annually early in spring; and controlling grazing and clipping frequently to control weeds. Pasture that has a good stand of legumes should not be topdressed with fertilizer containing nitrogen. Applications of nitrogen on established pasture tend to reduce the stand of legumes.

Use of the Soils in Engineering

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, water storage facilities, erosion control structures, drainage systems, and sewage disposal systems. Among these properties are permeability, compaction characteristics, grain size, plasticity, and reaction (pH). Also important are depth to the water table, depth to bedrock, flood hazard, and topography. Tables 5 and 6 provide soil data useful in engineering. The information was developed by soil scientists and engineers working together. It can be used to:

1. Make studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils for use in the planning of farm drainage structures, farm ponds, and irrigation systems.
3. Make preliminary evaluations that will aid in selecting locations for highways and airports and in planning detailed investigations of the selected locations.
4. Locate probable sources of sand and gravel and other construction materials.
5. Correlate performance of engineering structures with soil mapping units and thus develop information that will be useful in designing and maintaining new structures.
6. Determine the suitability of soil units for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and from aerial photographs, for the purpose of making maps and reports that engineers can use readily.
8. Make other preliminary estimates for construction purposes pertinent to areas for which laboratory data are not available.

Using the soil map for identification of soil areas, the engineering interpretations in tables 5 and 6 can be useful for many purposes. It should be emphasized, however, that these interpretations do not eliminate the need for sampling and testing at the site of specific engineering works that involve heavy loads and excavations deeper than the layers here reported.

No test data are provided in this soil survey, but data for soils similar to those in Rutherford County can be found in other published soil surveys.

Some terms used by soil scientists have a special meaning to soil scientists but may not be familiar to engineers. These terms are defined in the Glossary at the back of this survey and in the "Soil Survey Manual" (*7*).

Engineering Classification Systems

Engineers use two systems for classifying soils. The AASHTO system (*1*) was developed by the American Association of State Highway and Transportation Officials. The Unified system (*2*) was developed at the Waterways Experiment Station and has been adopted by the United States Department of Defense.

In the AASHTO system, all soil material is classified in seven principal groups. The groups range from A–l, which consists of soils that have the highest bearing capacity, to A–7, which consists of soils that have the lowest strength when wet. In the Unified system, soils are identified as coarse grained (eight classes), fine grained (six classes), and highly organic (one class). Classification in both systems is based on particle-size distribution and plasticity characteristics.

Soil scientists use the USDA textural classification (*7*). In this classification, the texture of the soil is determined according to the proportion of soil particles smaller than 2 millimeters, that is, the proportion of sand, silt, and clay. Textural modifiers, such as cherty, flaggy, and channery, are used as needed.

Table 5 shows the estimated classification of the soils in Rutherford County according to all three systems of classification.

Estimated Soil Properties Significant in Engineering

Several estimated soil properties significant in engineering are shown in table 5. The estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observation made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 5.

Depth to seasonal high water table is the distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Depth to bedrock is the distance from the surface of the soil to the upper surface of the rock layer.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content

TABLE 4.—*Estimated average yields per acre of the*

[Yields in columns A are those obtained under common management; yields in columns B are those expected

Soil	Corn		Cotton (lint)	
	A	B	A	B
	Bu	*Bu*	*Lbs*	*Lbs*
Almaville silt loam	32	45	280	400
Armour silt loam, 0 to 2 percent slopes	65	110	550	1,100
Armour silt loam, 2 to 5 percent slopes	60	100	500	1,000
Armour silt loam, 5 to 12 percent slopes	55	90	450	900
Arrington silt loam	65	115	600	1,200
Ashwood silty clay loam, 5 to 12 percent slopes	30	50	200	240
Ashwood silty clay loam, 12 to 20 percent slopes				
Barfield silty clay loam, 1 to 8 percent slopes				
Bodine cherty silt loam, 5 to 15 percent slopes				
Bodine cherty silt loam, 20 to 45 percent slopes				
Bradyville silt loam, 0 to 2 percent slopes	55	80	550	900
Bradyville silt loam, 2 to 5 percent slopes	50	75	475	765
Bradyville silt loam, 5 to 12 percent slopes, eroded	42	70	425	675
Bradyville silty clay loam, 2 to 5 percent slopes, severely eroded	35	50	300	500
Bradyville silty clay loam, 5 to 12 percent slopes, severely eroded	35	42	280	450
Bradyville-Rock outcrop complex, 0 to 2 percent slopes				
Bradyville-Rock outcrop complex, 2 to 12 percent slopes				
Bradyville-Urban land complex. Too variable to rate.				
Byler silt loam, 0 to 2 percent slopes	55	78	425	700
Byler silt loam, 2 to 5 percent slopes	52	75	400	675
Cannon cherty silt loam	55	80	450	700
Capshaw silt loam, 0 to 2 percent slopes	45	72	450	700
Capshaw silt loam, 2 to 5 percent slopes	42	65	375	600
Cumberland silt loam, 0 to 2 percent slopes	60	85	650	1,100
Cumberland silt loam, 2 to 5 percent slopes	55	80	575	950
Cumberland silt loam, 5 to 12 percent slopes, eroded	52	75	525	875
Cumberland silty clay loam, 2 to 5 percent slopes, severely eroded	38	50	375	600
Cumberland silty clay loam, 5 to 12 percent slopes, severely eroded	35	45	325	525
Dellrose cherty silt loam, 5 to 12 percent slopes	40	65	350	550
Dellrose cherty silt loam, 12 to 30 percent slopes				
Dellrose cherty silt loam, 30 to 40 percent slopes				
Dilton-Rock outcrop complex				
Dowellton silt loam	35	50	250	350
Eagleville silty clay loam	40	60	275	375
Egam silt loam	50	80	425	700
Gladeville-Rock outcrop-Talbott association, rolling				
Gullied land. Too variable to rate.				
Hampshire silt loam, 2 to 5 percent slopes	40	60	280	450
Hampshire silt loam, 5 to 12 percent slopes, eroded	35	55	260	400
Hampshire silt loam, 12 to 20 percent slopes, eroded				
Hampshire silty clay loam, 5 to 12 percent slopes, severely eroded				
Hampshire silty clay loam, 12 to 20 percent slopes, severely eroded				
Harpeth silt loam, 0 to 2 percent slopes	65	110	600	1,000
Harpeth silt loam, 2 to 5 percent slopes	65	95	550	900
Hillwood gravelly silt loam, 2 to 12 percent slopes	28	45	250	360
Hillwood gravelly silt loam, 12 to 20 percent slopes				
Inman flaggy silt loam, 5 to 12 percent slopes				
Inman flaggy silty clay loam, 12 to 30 percent slopes				
Lomond silt loam, 0 to 2 percent slopes	65	100	575	1,200
Lomond silt loam, 2 to 5 percent slopes	60	90	450	975
Lynnville silt loam	65	100	350	650
Melvin silt loam	45	65		
Mimosa-Rock outcrop complex, 5 to 20 percent slopes				
Mimosa-Rock outcrop complex, 20 to 40 percent slopes				
Mimosa soils, 5 to 12 percent slopes	35	50	225	330
Mimosa soils, 12 to 20 percent slopes				
Mimosa soils, 20 to 30 percent slopes				
Nesbitt silt loam, 0 to 2 percent slopes	55	85	600	1,100
Nesbitt silt loam, 2 to 5 percent slopes	52	75	600	1,000
Pits and Dumps. Too variable to rate.				
Roellen silty clay loam		60	300	450
Roellen silty clay		50	285	400
Sandhill channery loam, 12 to 20 percent slopes				
Sandhill channery loam, 20 to 30 percent slopes				

principal crops grown under two levels of management

under the highest feasible management. Absence of a yield figure indicates that the crop is not commonly grown]

Burley tobacco		Wheat		Lespedeza		Pasture	
A	B	A	B	A	B	A	B
Lbs	*Lbs*	*Bu*	*Bu*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
				0.4	0.9	95	160
1,900	2,300	36	48	1.2	2.0	140	210
1,800	2,300	35	48	1.2	1.8	140	200
1,700	2,150	32	46	1.1	1.7	130	190
1,800	2,200	28	40	1.3	2.0	145	210
1,000	1,200	25	35	.4	.7	80	130
		25	33	.3	.6	75	125
		20	28	.3	.6	60	95
		22	30	.3	.6	40	70
						40	65
1,700	1,900	33	48	1.0	1.7	120	190
1,600	1,750	32	46	1.0	1.6	115	180
1,500	1,700	30	44	.9	1.5	110	170
1,100	1,300	22	37	.7	1.2	80	130
1,000	1,200	20	32	.6	1.1	75	125
		22	30	.5	1.0	75	120
		17	24	.3	.7	50	95
1,600	1,800	32	44	.9	1.4	125	180
1,600	1,800	30	42	.7	1.2	120	170
1,450	1,600	25	34	.9	1.6	125	180
1,600	1,750	28	42	.8	1.4	125	180
1,600	1,750	26	40	.7	1.2	120	170
1,850	2,100	33	46	1.1	1.7	130	190
1,800	2,000	32	45	1.0	1.6	125	180
1,700	1,900	32	43	1.0	1.5	120	170
1,200	1,400	22	32	.6	.9	70	110
1,200	1,300	21	31	.4	.8	65	105
1,600	1,800	25	40	.7	1.3	130	175
				.5	1.0	120	160
						100	145
				.3	.7	55	90
				.5	1.0	95	150
		20	28	.8	1.4	90	150
1,300	1,500	22	32	.9	1.6	105	195
						40	
1,500	1,600	30	45	.7	1.2	100	165
1,350	1,500	30	44	.6	1.1	95	160
		25	40	.6	1.0	85	150
		18	28	.3	.7	75	120
		17	26	.3	.6	65	115
1,800	2,300	32	48	1.2	2.0	130	210
1,800	2,300	32	48	1.1	1.9	130	200
1,000	1,400	16	26	.5	.8	60	120
		15	22	.3	.5	55	100
		17	28	.3	.6	45	85
				.2	.3	25	50
1,800	2,300	33	48	1.1	1.9	135	210
1,800	2,200	33	46	.9	1.7	135	210
1,300	1,600	23	32	1.2	2.0	135	210
				.6	1.1	75	130
						35	60
						30	50
1,300	1,500	28	42	.6	1.2	75	125
		24	38	.5	1.0	60	95
						55	90
1,700	2,000	30	45	1.0	1.7	110	185
1,700	2,000	30	45	.8	1.5	105	170
		23	36	.9	1.6	90	150
		20	32	.8	1.5	90	150
		22	38	.4	.8	80	135
				.3	.6	70	120

TABLE 4.—*Estimated average yields per acre of the*

Soil	Corn		Cotton (lint)	
	A	B	A	B
	Bu	*Bu*	*Lbs*	*Lbs*
Stiversville silt loam, 2 to 5 percent slopes	50	80	475	950
Stiversville silt loam, 5 to 12 percent slopes	46	75	425	875
Stiversville silt loam, 12 to 20 percent slopes	42	70	375	750
Stiversville silt loam, 20 to 40 percent slopes				
Talbott silt loam, 0 to 2 percent slopes	38	60	375	650
Talbott silt loam, 2 to 5 percent slopes, eroded	36	55	275	400
Talbott silt loam, 5 to 12 percent slopes, eroded	30	50	230	310
Talbott silty clay loam, 2 to 5 percent slopes, severely eroded	22	35	200	290
Talbott silty clay loam, 5 to 12 percent slopes, severely eroded	22	32	200	275
Talbott silty clay loam, 12 to 20 percent slopes, severely eroded				
Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes				
Tupelo silt loam	35	55	300	425
Woodmont silt loam	35	60	375	500

[1] The number of days that one cow can graze 1 acre of pasture without injury to the pasture.

TABLE 5.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. the instructions for referring to other series that appear in

Soil series and map symbols	Depth to—		Depth from surface of typical profile	USDA texture	Classification		Coarse fraction greater than 3 inches
	Seasonal high water table	Bedrock			Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Almaville: Ae	0–2	5–>8	0–8	Silt loam	CL–ML, ML	A–4	0
			8–25	Silt loam	CL–ML, CL	A–4	0
			25–72	Silty clay loam, silt loam.	CL	A–4, A–6	0
Armour: AmA, AmB, AmC	>6	4–>8	0–13	Silt loam	CL–ML, CL, ML	A–4, A–6	0
			13–46	Silty clay loam, silt loam.	CL	A–4, A–6	0
			46–63	Silty clay, clay, silty clay loam.	CL, CH, MH	A–6, A–7	0–5
Arrington: Ar	3–>6	5–>8	0–40	Silt loam	CL–ML, CL, ML	A–4, A–6	0–2
			40–70	Silty clay loam, silty clay.	CL, CH, MH	A–6, A–7	0–5
Ashwood: AsC, AsD	>6	1½–3½	0–9	Silty clay loam, silty clay.	CL	A–6, A–7	0–5
			9–36	Clay	CH	A–7	0–5
Barfield: BaC	>6	½–1½	0–6	Silty clay loam	ML, CL, MH, CH	A–4, A–6, A–7	0–15
			6–18	Silty clay, clay	MH, CH	A–7	0–15
Bodine: BoC, BoE	>6	5–>8	0–7	Channery silt loam	ML, CL–ML, GM, SM, SM–SC, GM–GC	A–1, A–2, A–4	5–20
			7–65	Channery silt loam, channery silty clay loam.	GC, SC, SM–SC, GM–GC, GP–GC, SP–SC	A–1, A–4, A–6	10–30

principal crops grown under two levels of management—Continued

Burley tobacco		Wheat		Lespedeza		Pasture	
A	B	A	B	A	B	A	B
Lbs	*Lbs*	*Bu*	*Bu*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
	2,000		48		1.5		200
	1,900		47		1.3		190
	1,800		44		1.1		175
							165
1,400	1,650	28	46	.7	1.4	95	155
1,400	1,500	27	44	.6	1.1	85	140
1,200	1,350	25	40	.5	.9	70	125
1,000	1,100	17	28	.3	.7	55	100
1,000	1,100	17	26	.3	.5	50	90
				.2	.4	45	85
				.3	.5	30	65
		18	28	.5	1.3	80	135
		20	28	.5	1.2	80	135

significant in engineering

The soils in such mapping units have different properties and limitations, and for this reason it is necessary to follow carefully the first column of this table. The symbol > means more than]

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)			*Inches per hour*	*Inches per inch of soil*	*pH*	
95–100	95–100	90–100	85–95	20–30	2–7	0.6–2.0	0.20–0.22	5.1–6.5	Low.
95–100	90–100	85–95	80–90	20–30	5–10	0.6–2.0	0.20–0.22	5.1–5.5	Low.
90–100	80–100	75–95	70–95	25–35	8–20	0.06–0.2	0.12–0.16	5.1–7.8	Low.
95–100	90–100	85–100	85–100	25–35	4–12	0.6–2.0	0.18–0.22	5.1–6.0	Low.
95–100	85–100	80–100	80–100	28–40	8–18	0.6–2.0	0.17–0.20	5.1–6.0	Low.
95–100	95–100	90–100	80–100	30–52	10–26	0.2–2.0	0.10–0.18	5.1–6.0	Moderate.
95–100	90–95	85–95	85–95	25–38	3–15	0.6–2.0	0.19–0.22	6.1–7.8	Low.
95–100	85–100	80–100	80–100	30–52	10–25	0.2–2.0	0.15–0.20	6.1–7.8	Low.
95–100	95–100	90–100	70–95	32–50	15–27	0.6–2.0	0.15–0.20	5.6–7.3	Moderate.
95–100	95–100	90–100	70–95	50–65	25–40	0.2–0.6	0.12–0.15	6.1–7.3	High.
85–100	80–95	75–90	70–85	30–55	8–25	0.2–0.6	0.14–0.17	6.1–7.8	Moderate.
85–100	75–90	70–85	65–80	51–70	18–35	0.2–0.6	0.12–0.15	6.1–7.8	High.
50–75	45–65	35–60	30–55	20–30	2–7	2.0–6.0	0.07–0.12	4.5–5.5	Low.
15–55	10–50	5–40	5–35	20–35	5–15	2.0–6.0	0.05–0.10	4.5–5.5	Low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface of typical profile	USDA texture	Classification		Coarse fraction greater than 3 inches
	Seasonal high water table	Bedrock			Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Bradyville: BrA, BrB, BrC2, BsB3, BsC3, BtA, BtC, Bu. Rock outcrop parts of BtA and BtC consist of bare or nearly bare limestone rock. Urban land part of Bu consists of built-up or disturbed land. Reliable estimates cannot be made for Rock outcrop or for Urban land.	>6	3½–5	0–6	Silt loam, silty clay loam.	CL–ML, CL	A–4, A–6	0–5
			6–20	Silty clay loam, silty clay.	CL, CH	A–7	0–5
			20–48	Silty clay, clay	CH	A–7	0–5
Byler: ByA, ByB	1½–2½	5–>8	0–8	Silt loam	CL–ML, CL	A–4	0
			8–25	Silt loam, silty clay loam.	CL–ML, CL	A–4, A–6	0
			25–46	Silt loam, silty clay loam.	CL, ML	A–6, A–7	0
			46–65	Silty clay, clay	ML, MH	A–7	0
Cannon: Ca	3–>6	5–>8	0–26	Channery silt loam	GC, GM–GC, SM–SC, CL–ML, CL, SC	A–4, A–6, A–2	0–5
			26–50	Channery silt loam, channery silty clay loam.	CL–ML, CL, CH, SM, SC, GC, SM–SC, GM–GC	A–4, A–6, A–7, A–2	0–10
Capshaw: CpA, CpB	1½–2½	4–>8	0–7	Silt loam	ML, CL, CL–ML	A–4	0
			7–19	Silty clay loam, silty clay.	CL	A–6, A–7	0
			19–46	Silty clay, clay	CH, CL	A–6, A–7	0
			46–60	Clay	CH, CL	A–6, A–7	0
Cumberland: CuA, CuB, CuC2, CvB3, CvC3.	>6	5–>8	0–8	Silt loam, silty clay loam.	CL–ML, ML, CL	A–4, A–6	0
			8–14	Silty clay loam, silty clay.	CL, ML	A–6, A–7	0
			14–64	Clay, silty clay	CH, MH, CL, ML	A–7	0
Dellrose: DeC, DeE, DeF	>6	5–>8	0–13	Channery silt loam	SC, CL, CL–ML, GC–GM, SC–SM, GM, GC	A–4, A–6	0–5
			13–63	Channery silty clay loam, channery silt loam.	ML, CL, SC, GM, GC, SM, CL–ML, SM–SC, GM–GC	A–4, A–6	0–10
Dilton: Df Rock outcrop part consists of bare or nearly bare limestone rock. Reliable estimates cannot be made.	0–2	½–1½	0–12	Silty clay loam, silty clay.	CH, CL	A–7, A–6	0–5
			12–16	Clay, silty clay	CH	A–7	0–10
Dowellton: Do	0–1½	3½–5	0–11	Silt loam	CL–ML, CL	A–4, A–6	0
			11–20	Silty clay	CH	A–7	0
			20–46	Clay	CH	A–7	0
Eagleville: Ea	0–2	1½–3½	0–11	Silty clay loam, silty clay, silt loam.	CH, CL	A–7, A–6	0
			11–35	Clay, silty clay	CH	A–7	0

significant in engineering—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
						Inches per hour	*Inches per inch of soil*	*pH*	
85–100	85–95	75–90	65–85	25–35	5–15	0.6–2.0	0.14–0.20	5.1–6.0	Low.
80–100	80–95	65–90	65–85	41–60	20–35	0.6–2.0	0.12–0.17	5.1–6.0	Moderate.
90–100	85–95	70–90	70–85	50–70	25–45	0.2–2.0	0.12–0.16	5.1–7.8	Moderate.
100	90–100	85–95	75–90	20–25	4–9	0.6–2.0	0.18–0.22	5.1–6.0	Low.
100	90–100	85–100	85–95	25–40	5–15	0.6–2.0	0.17–0.20	5.1–6.0	Low.
100	90–100	85–100	80–95	30–45	11–20	0.06–0.2	0.10–0.15	5.1–6.0	Low.
95–100	90–100	80–95	75–90	45–60	15–25	0.2–0.6	0.10–0.15	5.1–6.0	Moderate.
60–85	55–75	45–70	30–65	20–35	5–15	2.0–6.0	0.12–0.16	5.6–7.3	Low.
60–100	55–100	45–95	40–95	25–60	5–35	2.0–6.0	0.10–0.15	5.6–7.3	Low to moderate.
85–100	80–100	70–95	65–95	20–30	4–9	0.6–2.0	0.17–0.22	5.1–6.0	Low.
85–100	80–100	70–95	65–95	30–42	11–22	0.6–2.0	0.14–0.20	5.1–6.0	Low.
85–100	80–100	75–95	70–95	40–65	20–38	0.06–0.2	0.12–0.18	5.1–6.0	Moderate.
80–100	75–100	75–95	70–95	40–68	20–38	0.06–0.2	0.12–0.15	5.6–7.8	Moderate.
95–100	90–100	85–100	65–90	20–35	3–15	0.6–2.0	0.17–0.20	5.1–6.0	Low.
95–100	90–100	85–100	65–90	32–45	12–18	0.6–2.0	0.17–0.19	5.1–6.0	Moderate.
90–100	85–100	85–100	75–90	41–60	16–30	0.6–2.0	0.15–0.18	5.1–6.0	Moderate.
55–85	55–80	50–80	45–75	20–30	4–9	2.0–6.0	0.10–0.15	5.1–6.0	Low.
60–85	55–80	50–75	45–70	27–40	5–15	2.0–6.0	0.09–0.14	5.1–6.0	Low.
95–100	90–100	90–100	85–100	40–60	20–35	0.06–0.2	0.14–0.18	6.1–7.8	Moderate.
80–100	75–100	75–100	70–100	51–70	25–40	0.06–0.2	0.12–0.16	6.1–7.8	Moderate.
95–100	95–100	90–100	85–95	25–35	7–15	0.6–2.0	0.15–0.18	5.1–7.3	Low.
95–100	95–100	90–100	85–95	51–65	25–40	0.2–0.6	0.14–0.16	5.1–7.3	High.
95–100	95–100	90–100	85–95	51–70	27–40	0.06–0.2	0.12–0.15	5.1–7.8	High.
100	100	100	90–100	37–55	15–30	0.06–0.2	0.14–0.18	5.6–7.8	Moderate.
90–100	90–100	85–100	80–100	51–70	25–40	0.06–0.2	0.12–0.16	5.6–7.8	Moderate to high.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface of typical profile	USDA texture	Classification		Coarse fraction greater than 3 inches
	Seasonal high water table	Bedrock			Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Egam: Eg	1–2	3½–>8	0–10	Silt loam, silty clay loam.	CL	A–6, A–7	0
			10–31	Silty clay loam, silty clay.	CL, CH	A–7	0–5
			31–35	Clay, silty clay, silty clay loam.	CH, CL	A–7	0–5
*Gladeville: GRC For Talbott part, see Talbott series. Rock outcrop part consists of bare or nearly bare limestone rock. Reliable estimates cannot be made. Gullied land: Gu. Properties too variable for reliable estimates. Onsite investigation required.	>6	½–1	0–10	Flaggy silty clay loam, flaggy silty clay.	GC, CL, CH, SC	A–2, A–6, A–7	5–20
Hampshire: HaB, HaC2, HaD2, HbC3, HbD3.	>6	3½–5	0–6	Silt loam, silty clay loam.	CL–ML, CL	A–4, A–6	0–2
			6–40	Clay, silty clay, silty clay loam.	CL, CH, MH	A–7	0–5
			40–55	Clay, flaggy clay	CL, CH, GC	A–2, A–6, A–7	5–60
Harpeth: HcA, HcB	4–>6	5–>8	0–17	Silt loam	CL–ML, CL	A–4	0
			17–78	Silty clay loam, silt loam.	CL	A–4, A–6	0–2
			78–85	Silty clay loam, silty clay, clay.	CL, CH, MH	A–6, A–7	0–5
Hillwood: HgC, HgD	>6	5–>8	0–9	Gravelly silt loam, gravelly silty clay loam.	ML, CL, GM, GC	A–4, A–6	0–5
			9–62	Gravelly silty clay loam, gravelly silty clay, gravelly clay.	GP–GC, GC	A–2	0–5
			62–70	Clay, silty clay loam	CH, CL	A–7	0–5
Inman: InC, InE	>6	1½–3½	0–8	Flaggy silt loam, flaggy silty clay loam.	CL, CL–ML	A–4, A–6	15–30
			8–12	Flaggy silty clay, flaggy clay.	CL, CH, MH	A–6, A–7	25–35
			12–30	Flaggy clay, flaggy silty clay.	GC	A–2, A–6, A–7	30–60
Lomond: LoA, LoB	>6	5–>8	0–9	Silt loam	CL–ML, CL	A–4	0
			9–49	Silty clay loam	CL, ML	A–6, A–7	0
			49–70	Clay, silty clay	MH, CH	A–7	0
Lynnville: Ly	1–2	3½–8	0–34	Silt loam	CL–ML, CL	A–4	0–5
			34–45	Silty clay loam, silty clay, clay.	CL, CH	A–6, A–7	0–5
Melvin: Me	0–2	3½–8	0–27	Silt loam	CL–ML, CL	A–4	0
			27–53	Silty clay loam, silty clay, clay.	CL, CH	A–6, A–7	0–5
Mimosa: MrD, MrE, MsC, MsD, MsE. Rock outcrop parts of MrD and MrE consist of bare or nearly bare limestone rock. Reliable estimates cannot be made.	>6	3½–5	0–6	Cherty silt loam, cherty silty clay loam.	CL–ML, CL	A–4, A–6	0–5
			6–12	Silty clay, clay	CL, CH	A–6, A–7	0–5
			12–55	Clay, silty clay	CH, MH	A–7	

significant in engineering—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
						Inches per hour	*Inches per inch of soil*	*pH*	
95–100	95–100	90–100	85–95	30–45	10–22	0.6–2.0	0.18–0.22	5.6–7.3	Low to moderate.
95–100	90–100	90–100	85–95	40–60	20–32	0.2–0.6	0.15–0.18	5.6–7.3	Moderate.
95–100	90–100	85–100	80–100	40–60	20–32	0.2–0.6	0.12–0.17	6.1–7.3	Moderate.
40–65	30–55	25–55	20–55	38–55	20–34	0.6–2.0	0.05–0.11	6.6–8.4	Moderate.
95–100	95–100	85–95	75–90	25–35	7–15	0.6–2.0	0.16–0.20	5.1–6.0	Low.
85–100	80–100	70–90	60–85	45–65	20–35	0.6–2.0	0.12–0.15	4.5–6.0	Moderate.
40–95	40–95	40–85	30–80	45–65	20–35	0.6–2.0	0.05–0.10	4.5–6.5	Moderate.
95–100	90–100	85–100	80–95	20–30	5–9	0.6–2.0	0.18–0.22	5.1–6.0	Low.
95–100	85–100	80–100	75–95	30–40	10–18	0.6–2.0	0.16–0.20	5.1–6.0	Low.
95–100	95–100	85–100	80–100	30–60	12–30	0.2–0.6	0.10–0.15	5.1–6.0	Low to moderate
50–80	50–75	50–65	45–55	25–38	5–15	2.0–6.0	0.08–0.14	5.1–5.5	Low.
10–55	10–50	10–40	10–30	35–55	15–25	2.0–6.0	0.06–0.11	5.1–5.5	Moderate.
90–100	90–100	90–100	85–100	45–65	25–40	0.6–2.0	0.10–0.15	5.6–6.5	Moderate.
70–85	65–80	60–75	55–70	25–35	5–15	0.6–2.0	0.08–0.12	5.1–7.3	Low.
65–75	60–70	55–65	50–60	40–65	20–35	0.2–0.6	0.06–0.10	5.1–7.3	Moderate.
40–70	30–50	25–45	20–40	40–60	20–35	0.2–0.6	0.06–0.10	5.6–7.8	Moderate.
100	95–100	80–95	70–90	20–30	5–10	0.6–2.0	0.18–0.22	5.1–5.5	Low.
100	95–100	85–100	85–95	35–45	11–20	0.6–2.0	0.17–0.20	5.1–5.5	Low.
100	80–100	75–95	70–90	52–80	23–46	0.6–2.0	0.12–0.15	5.1–6.5	Moderate.
90–100	90–100	85–100	80–95	20–30	5–10	0.6–2.0	0.17–0.21	5.6–7.3	Low.
95–100	95–100	80–100	75–95	30–60	15–40	0.6–2.0	0.10–0.15	5.6–7.8	Low to moderate.
95–100	95–100	90–100	80–95	20–30	5–10	0.6–2.0	0.17–0.21	5.6–7.3	Low.
90–100	85–100	85–95	80–95	30–65	15–40	0.2–2.0	0.12–0.16	6.1–7.8	Low to moderate.
75–100	70–100	65–95	60–90	30–40	9–20	0.6–2.0	0.12–0.18	4.5–6.0	Low.
85–100	85–100	80–95	75–90	40–55	20–30	0.2–0.6	0.10–0.16	4.5–6.0	Moderate.
90–100	90–100	90–95	85–95	50–74	23–40	0.2–0.6	0.10–0.15	4.5–7.3	Moderate to high.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface of typical profile	USDA texture	Classification		Coarse fraction greater than 3 inches
	Seasonal high water table	Bedrock			Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Nesbitt: NeA, NeB	5–6	5–>8	0–8	Silt loam	CL-ML, CL	A–4	0
			8–25	Silty clay loam, silt loam.	CL, ML	A–6, A–7	0
			25–55	Silty clay loam	CL	A–6, A–7	0
			55–65	Silty clay, clay	MH, CH, CL	A–7	0
Pits and Dumps: Pd. Properties too variable for reliable estimates. Onsite investigation required.							
Roellen: Ro, Ru	0–2	3½–8	0–7	Silty clay, silty clay loam.	CH, MH, CL	A–7, A–6	0
			7–58	Clay, silty clay	CH, MH	A–7	0
Sandhill: SaD, SaE	>6	3½–5½	0–7	Channery loam	CL–ML, ML, CL	A–4	10–30
			7–43	Channery clay loam, channery loam.	CL–ML, CL	A–4, A–6	10–30
			43–50	Flaggy loam, flaggy clay loam.	GM–GP	A–2, A–1	60–80
Stiversville: StB, StC, StD, StE.	>6	3½–5½	0–8	Silt loam, loam	ML, CL	A–4	0–5
			8–50	Clay loam, loam	CL–ML, CL	A–4, A–6	0–5
			50–58	Flaggy clay loam	GM–GP	A–2, A–1	60–80
*Talbott: TaA, TaB2, TaC2, TbB3, TbC3, TbD3, TrC. For Barfield part of TrC, see Barfield series. Rock outcrop part of TrC consists of bare or nearly bare limestone rock. Reliable estimates cannot be made.	>6	1½–3½	0–6	Silt loam, silty clay loam.	CL–ML, CL	A–4, A–6	0–5
			6–37	Clay	MH–CH, CL	A–7	0–10
Tupelo: Tu	1–2	3½–6	0–8	Silt loam	CL–ML, CL	A–4, A–6	0
			8–15	Silty clay loam, silty clay.	CL, CH, MH	A–7	0
			15–65	Clay, silty clay	CH, MH	A–7	0
Woodmont: Wo	1–2	5–8	0–8	Silt loam	CL–ML, CL	A–4	0
			8–23	Silt loam	CL–ML, CL	A–4, A–6	0
			23–62	Silty clay loam, silt loam.	CL	A–4, A–6	0

significant in engineering—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
						Inches per hour	*Inches per inch of soil*	*pH*	
95–100	90–100	80–95	75–90	20–30	4–9	0.6–2.0	0.18–0.22	5.1–5.5	Low.
95–100	95–100	85–95	85–95	30–45	10–20	0.6–2.0	0.17–0.20	5.1–5.5	Low.
95–100	90–100	80–95	75–95	30–45	10–20	0.6–2.0	0.14–0.17	5.1–5.5	Low.
95–100	80–100	75–95	70–90	45–70	20–35	0.2–0.6	0.10–0.15	5.1–6.0	Moderate.
95–100	95–100	95–100	90–100	40–65	15–35	0.06–0.6	0.15–0.19	5.6–7.3	High.
95–100	95–100	90–100	85–100	51–70	25–40	0.06–0.2	0.10–0.15	5.6–7.8	High.
80–85	75–80	70–75	60–65	15–30	3–9	2.0–6.0	0.10–0.12	5.1–6.0	Low.
80–85	75–80	60–70	50–60	20–35	5–15	2.0–6.0	0.08–0.11	5.1–6.0	Low.
15–25	15–20	10–15	5–10	20–35	5–20	2.0–6.0	0.03–0.08	5.1–6.0	Low.
90–100	80–100	65–85	55–80	15–30	3–9	2.0–6.0	0.15–0.20	5.1–6.0	Low.
90–100	80–100	60–85	50–80	20–35	5–15	2.0–6.0	0.12–0.18	5.1–6.0	Low.
15–25	15–20	10–15	5–10	20–35	5–20	2.0–6.0	0.03–0.08	5.1–6.0	Low.
95–100	95–100	90–100	70–100	25–35	5–15	0.6–2.0	0.14–0.18	5.1–6.0	Low.
95–100	95–100	90–100	80–100	40–75	15–40	0.2–0.6	0.10–0.15	5.1–7.8	Moderate to high.
100	95–100	90–100	70–90	25–35	5–15	0.6–2.0	0.18–0.20	5.1–6.0	Low.
100	95–100	90–100	85–95	45–60	20–30	0.06–0.2	0.15–0.18	5.1–6.0	Moderate.
95–100	95–100	90–100	75–95	51–70	25–40	0.06–0.2	0.12–0.17	5.1–7.8	Moderate to high.
100	95–100	90–100	85–95	20–30	5–10	0.6–2.0	0.18–0.20	5.1–5.5	Low.
100	95–100	90–100	85–95	25–35	5–15	0.6–2.0	0.18–0.20	5.1–5.5	Low.
95–100	85–100	80–100	80–95	25–40	8–20	0.06–0.2	0.10–0.12	5.1–7.8	Low.

TABLE 6.—*Interpretations of engineering*

["Percs slowly" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such mapping units may to other series that appear in the first column of this table]

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Almaville: Ae	Severe: wetness; percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Armour:						
AmA, AmB	Slight	Moderate: seepage.	Slight	Slight	Slight	Moderate: low strength.
AmC	Slight	Severe: slope	Slight	Slight	Slight	Moderate: low strength.
Arrington: Ar	Severe: flooding.	Moderate: flooding; seepage.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Ashwood: AsC, AsD.	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock; too clayey.	Severe: low strength; shrink-swell.	Severe: depth to rock; too clayey.	Severe: low strength; shrink-swell.
Barfield: BaC	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Bodine:						
BoC	Moderate: slope.	Severe: slope; seepage.	Moderate: small stones.	Slight	Slight	Moderate: slope.
BoE	Severe: slope	Severe: slope	Severe: slope; small stones.	Severe: slope	Severe: slope	Severe: slope
Bradyville:						
BrA, BrB, BsB3, Bu. Urban land part of Bu is too variable to be rated.	Moderate: depth to rock; percs slowly.	Moderate: depth to rock.	Moderate: depth to rock; too clayey.	Moderate: low strength.	Severe: depth to rock; too clayey.	Severe: low strength.
BrC2, BsC3	Moderate: depth to rock; percs slowly.	Severe: slope; depth to rock.	Moderate: depth to rock; too clayey.	Moderate: low strength.	Severe: depth to rock; too clayey.	Severe: low strength.
BtA, BtC The Rock outcrop parts of BtA and BtC are too variable to rate.	Moderate: depth to rock; percs slowly.	Severe: depth to rock.	Severe: depth to rock; too clayey.	Moderate: depth to rock; low strength.	Severe: depth to rock; too clayey.	Severe: depth to rock; low strength.
Byler: ByA, ByB	Severe: percs slowly.	Slight	Slight	Moderate: wetness.	Slight	Moderate: low strength.
Cannon: Ca	Severe: flooding.	Severe: flooding; seepage.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Capshaw: CpA, CpB.	Severe: percs slowly.	Moderate: depth to rock; slope.	Moderate: too clayey.	Moderate: low strength.	Moderate: too clayey; depth to rock.	Severe: low strength.

properties of the soils

definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. An asterisk in the first column indicates have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring

Degree and kind of limitation for—Con't	Suitability as source of—		Soil features affecting—			
Light industry	Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Severe: wetness.	Poor: wetness	Poor: wetness	Favorable	Piping	Percs slowly; poor outlets.	Not needed.
Slight	Fair: low strength.	Good	Seepage	Low strength	Not needed	Favorable.
Moderate: slope.	Fair: low strength.	Good	Seepage	Low strength	Not needed	Favorable.
Severe: flooding.	Fair: low strength.	Good	Seepage	Low strength	Not needed	Not needed.
Severe: shrink-swell; low strength; slope.	Poor: low strength; shrink-swell; thin layer.	Poor: too clayey; thin layer.	Depth to rock	Thin layer; compressible.	Not needed	Depth to rock; slope.
Severe: depth to rock.	Poor: thin layer; low strength.	Poor: thin layer; too clayey.	Depth to rock	Thin layer; compressible.	Not needed	Depth to rock.
Moderate: slope.	Good	Poor: small stones.	Seepage	Favorable	Not needed	Slope.
Severe: slope	Fair: slope	Poor: small stones.	Slope, seepage	Favorable	Not needed	Slope.
Moderate: depth to rock; low strength.	Poor: low strength.	Fair: thin layer; too clayey.	Depth to rock	Low strength; thin layer; compressible.	Not needed	Favorable.
Moderate: slope; low strength.	Poor: low strength.	Fair: thin layer; too clayey.	Depth to rock	Low strength; thin layer; compressible.	Not needed	Slope.
Moderate: depth to rock; low strength.	Poor: depth to rock; low strength.	Poor: thin layer; too clayey.	Depth to rock	Thin layer; low strength; compressible.	Not needed	Depth to rock.
Moderate: low strength.	Fair: low strength.	Fair: thin layer.	Favorable	Piping	Not needed	Erodes easily.
Severe: flooding.	Good	Poor: small stones.	Seepage	Piping	Not needed	Not needed.
Moderate: low strength.	Poor: low strength.	Poor: thin layer; too clayey.	Depth to rock	Compressible; hard to pack.	Not needed	Features favorable.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Cumberland: CuA, CuB, CvB3.	Slight	Slight	Slight	Moderate: low strength.	Moderate: too clayey.	Moderate: low strength.
CuC2, CvC3	Moderate: slope.	Severe: slope	Slight	Moderate: slope; low strength.	Moderate: too clayey.	Moderate: low strength.
Dellrose: DeC	Moderate: slope.	Severe: slope; seepage.	Moderate: small stones.	Moderate: slope.	Moderate: slope.	Moderate: slope.
DeE, DeF	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Dilton: Df The Rock outcrop part of Df is too variable to rate.	Severe: flooding; depth to rock; percs slowly.	Severe: depth to rock; wetness.	Severe: depth to rock.	Severe: flooding; depth to rock; wetness.	Severe: depth to rock; wetness; flooding.	Severe: flooding; wetness; low strength.
Dowellton: Do	Severe: wetness; percs slowly.	Moderate: depth to rock.	Severe: wetness; too clayey.	Severe: wetness; shrink-swell.	Severe: wetness; too clayey; depth to rock.	Severe: wetness; low strength; shrink-swell.
Eagleville: Ea	Severe: flooding; wetness; percs slowly.	Severe: depth to rock; wetness; flooding.	Severe: depth to rock; wetness; too clayey.	Severe: wetness; flooding.	Severe: wetness; flooding; depth to rock; too clayey.	Severe: flooding; wetness.
Egam: Eg	Severe: flooding; percs slowly.	Severe: flooding; wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding; too clayey.	Severe: flooding; low strength.
*Gladeville: GRC For Talbott part, see Talbott series. Rock outcrop part consists of bare or nearly bare limestone rock; reliable interpretations cannot be made.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Gullied land: Gu. Too variable for valid interpretations. Onsite investigation required.						

properties of the soils—Continued

Degree and kind of limitation for—Con't	Suitability as source of—		Soil features affecting—			
Light industry	Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Moderate: low strength.	Fair: low strength.	Fair: thin layer; too clayey.	Seepage	Compressible; hard to pack.	Not needed	Features favorable.
Severe: slope; low strength.	Fair: low strength.	Fair: thin layer; too clayey.	Seepage	Compressible; hard to pack.	Not needed	Slope.
Severe: slope	Fair: low strength.	Poor: small stones.	Seepage; slope	Favorable	Not needed	Slope.
Severe: slope	Poor: slope	Poor: slope	Slope; seepage	Slope	Not needed	Slope.
Severe: flooding; wetness; low strength.	Poor: thin layer; low strength; wetness.	Poor: wetness; too clayey; thin layer.	Depth to rock	Compressible; thin layer.	Depth to rock	Not needed.
Severe: wetness; low strength; shrink-swell.	Poor: wetness; low strength; shrink-swell.	Poor: wetness; too clayey.	Depth to rock	Compressible; low strength; hard to pack.	Slow permeability.	Not needed.
Severe: flooding; wetness.	Poor: wetness; low strength.	Poor: wetness; too clayey.	Depth to rock	Compressible; low strength; hard to pack.	Moderately slow permeability.	Not needed.
Severe: low strength; flooding.	Poor: low strength.	Fair: too clayey.	Favorable	Compressible; low strength; hard to pack.	Flooding; moderately slow permeability.	Not needed.
Severe: depth to rock.	Poor: thin layer.	Poor: thin layer.	Depth to rock	Thin layer	Not needed	Depth to rock.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Hampshire: HaB, HaC2, HbC3.	Moderate: percs slowly.	Moderate: slope; depth to rock.	Moderate: too clayey.	Slight	Severe: depth to rock; too clayey.	Moderate: low strength.
HaD2, HbD3	Moderate: slope; depth to rock; percs slowly.	Severe: slope; depth to rock.	Moderate: slope; too clayey.	Moderate: slope.	Severe: depth to rock: too clayey.	Moderate: slope; low strength.
Harpeth: HcA, HcB.	Slight	Moderate: seepage.	Slight	Slight	Slight	Moderate: low strength.
Hillwood: HgC	Slight	Severe: slope; seepage.	Moderate: small stones.	Slight	Moderate: small stones.	Slight
HgD	Moderate: slope.	Severe: slope; seepage.	Moderate: small stones; slope.	Moderate: slope.	Moderate: small stones; slope.	Moderate: slope.
Inman: InC	Severe: depth to rock; percs slowly.	Severe: slope; depth to rock.	Severe: depth to rock; small stones.	Moderate: low strength.	Severe: depth to rock; too clayey.	Severe: low strength.
InE	Severe: slope; depth to rock; percs slowly.	Severe: slope; depth to rock.	Severe: slope; depth to rock; small stones.	Severe: slope; low strength.	Severe: slope; depth to rock; too clayey.	Severe: slope; low strength; expansive.
Lomond: LoA, LoB.	Slight	Moderate: seepage.	Slight	Slight	Slight	Moderate: low strength.
Lynnville: Ly	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Melvin: Me	Severe: flooding; wetness.	Severe: flooding.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.	Severe: flooding; wetness.
Mimosa: MrD, MrE Rock outcrop part of MrD and MrE is too variable to rate.	Severe: slope; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock; too clayey; slope.	Severe: low strength; slope; shrink-swell; rock outcrops.	Severe: depth to rock; too clayey.	Severe: rock outcrops; low strength; slope; shrink-swell.
MsC	Severe: percs slowly.	Moderate: slope; depth to rock.	Moderate: too clayey.	Moderate: low strength; shrink-swell.	Severe: depth to rock; too clayey.	Severe: low strength; shrink-swell.
MsD, MsE	Severe: slope; percs slowly.	Severe: slope; depth to rock.	Severe: slope; too clayey.	Severe: slope; low strength; shrink-swell.	Severe: depth to rock; too clayey.	Severe: slope; low strength; shrink-swell.
Nesbitt: NeA, NeB.	Moderate: percs slowly.	Slight	Slight	Slight	Slight	Moderate: low strength.
Pits and Dumps: Pd. Too variable for reliable interpretations.						

properties of the soils—Continued

Degree and kind of limitation for—Con't	Suitability as source of—		Soil features affecting—			
Light industry	Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Moderate: slope.	Poor: low strength.	Poor: thin layer; too clayey.	Depth to rock	Compressible; low strength.	Not needed	Depth to rock.
Severe: slope	Poor: low strength.	Poor: thin layer; too clayey.	Depth to rock	Compressible; low strength.	Not needed	Slope; depth to rock.
Slight	Fair: low strength.	Good	Seepage	Piping	Not needed	Features favorable.
Moderate: slope.	Good	Poor: small stones.	Seepage	Favorable	Not needed	Small stones.
Severe: slope	Good	Poor: small stones.	Seepage; slope	Favorable	Not needed	Slope; small stones.
Severe: low strength; slope.	Poor: low strength; thin layer.	Poor: too clayey; thin layer; small stones.	Depth to rock	Compressible; low strength; thin layer.	Not needed	Slope; depth to rock.
Severe: slope; low strength.	Poor: slope; low strength; thin layer.	Poor: slope; too clayey; small stones.	Depth to rock; slope.	Compressible; low strength; thin layer.	Not needed	Slope; depth to rock.
Slight	Fair: low strength.	Fair: too clayey.	Seepage	Piping	Not needed	Features favorable.
Severe: flooding.	Fair: low strength.	Good	Seepage	Piping	Flooding	Not needed.
Severe: flooding; wetness.	Fair: wetness; low strength.	Good	Favorable	Piping; low strength.	Flooding	Not needed.
Severe: rock outcrops; low strength; shrink-swell; slope.	Poor: low strength; shrink-swell; slope.	Poor: too clayey.	Depth to rock; slope.	Compressible; low strength; hard to pack.	Not needed	Depth to rock; slope; rock outcrops.
Moderate: low strength; shrink-swell.	Poor: low strength; shrink-swell.	Poor: too clayey.	Depth to rock	Compressible; low strength; hard to pack.	Not needed	Depth to rock.
Severe: slope; low strength; shrink-swell.	Poor: slope; low strength; shrink-swell.	Poor: too clayey.	Depth to rock	Compressible; low strength; hard to pack.	Not needed	Depth to rock; slope.
Slight	Fair: low strength.	Good	Favorable	Low strength; piping.	Not needed	Features favorable.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Roellen: Ro, Ru	Severe: wetness; flooding; percs slowly.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding; shrink-swell.	Severe: too clayey; wetness; flooding.	Severe: wetness; flooding; shrink-swell.
Sandhill:						
SaD	Moderate: depth to rock; slope.	Severe: slope; seepage.	Moderate: slope; small stones.	Moderate: slope.	Moderate: depth to rock.	Moderate: slope.
SaE	Severe: depth to rock; slope.	Severe: slope	Severe: slope; small stones.	Severe: slope	Severe: depth to rock; slope.	Severe: slope
Stiversville:						
StB, StC	Moderate: depth to rock.	Severe: seepage.	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: low strength.
StD	Moderate: slope; depth to rock.	Severe: slope; seepage.	Moderate: slope; depth to rock.	Moderate: slope.	Moderate: depth to rock.	Moderate: slope.
StE	Severe: slope; depth to rock.	Severe: slope	Severe: slope; depth to rock.	Severe: slope	Severe: slope	Severe: slope
*Talbott:						
TaA, TaB2, TbB3.	Severe: depth to rock; percs slowly.	Severe: depth to rock.	Severe: depth to rock; too clayey.	Moderate: depth to rock; shrink-swell.	Severe: depth to rock; too clayey.	Severe: low strength; shrink-swell.
TaC2, TbC3, TbD3.	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock; too clayey.	Moderate: slope; depth to rock; shrink-swell.	Severe: depth to rock; too clayey.	Severe: low strength; slope; shrink-swell.
TrC For Barfield part, see Barfield series. Rock outcrop part consists of bare or nearly bare limestone rock; reliable interpretations cannot be made.	Severe: depth to rock; percs slowly.	Severe: depth to rock.	Severe: depth to rock; too clayey.	Severe: depth to rock; shrink-swell; rock outcrops.	Severe: depth to rock; too clayey.	Severe: depth to rock; low strength; shrink-swell.
Tupelo: Tu	Severe: wetness; percs slowly.	Moderate: depth to rock.	Severe: wetness; too clayey.	Severe: wetness; shrink-swell.	Severe: wetness; too clayey.	Severe: wetness; low strength; shrink-swell.
Woodmont: Wo	Severe: wetness; percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness; low strength.

properties of the soils—Continued

Degree and kind of limitation for—Con't	Suitability as source of—		Soil features affecting—			
Light industry	Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Severe: wetness; shrink-swell; flooding.	Poor: low strength; wetness; shrink-swell.	Poor: wetness; too clayey.	Favorable	Compressible; low strength; hard to pack.	Flooding; slow permeability.	Not needed.
Severe: slope	Good	Poor: small stones.	Depth to rock; seepage.	Favorable	Not needed	Slope.
Severe: slope	Fair: slope	Poor: slope; small stones.	Depth to rock; slope; seepage.	Slope	Not needed	Slope.
Moderate: slope.	Fair: low strength.	Fair: thin layer.	Depth to rock	Piping; low strength.	Not needed	Features favorable.
Severe: slope	Fair: slope	Fair: thin layer; slope.	Depth to rock; seepage.	Piping; low strength.	Not needed	Slope.
Severe: slope	Fair: slope	Poor: slope	Depth to rock; slope; seepage.	Piping; low strength.	Not needed	Slope.
Moderate: depth to rock; shrink-swell; low strength.	Poor: thin layer; low strength; shrink-swell.	Poor: thin layer; too clayey.	Depth to rock	Thin layer; low strength; compressible; hard to pack.	Not needed	Depth to rock.
Severe: depth to rock; shrink-swell; low strength; slope.	Poor: thin layer; low strength; shrink-swell.	Poor: thin layer; too clayey.	Depth to rock	Thin layer; low strength; compressible; hard to pack.	Not needed	Depth to rock; slope.
Severe: depth to rock; low strength; shrink-swell.	Poor: thin layer; low strength; shrink-swell.	Poor: thin layer; too clayey.	Depth to rock	Thin layer; low strength; compressible; hard to pack.	Not needed	Rock outcrops; depth to rock; slope.
Severe: wetness; low strength; shrink-swell.	Poor: low strength; wetness; shrink-swell.	Poor: wetness; too clayey.	Depth to rock	Low strength; compressible; hard to pack.	Slow permeability; poor outlets.	Not needed.
Severe: wetness.	Fair: wetness; low strength.	Fair: wetness; thin layer.	Favorable	Low strength; piping.	Slow permeability.	Not needed.

is further increased, the material changes from a plastic to a liquid state. The *plastic limit* is the moisture content at which the soil material changes from the semisolid to plastic state, and the *liquid limit* is the moisture content at which the soil material changes from a plastic to a liquid state. The *plasticity index* is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated for noncompacted soil material. The estimates are based on structure and consistence of the soil material and on field observations.

Available water capacity is the ability of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most plants.

Reaction is the degree of acidity or alkalinity of a soil, expressed as a pH value. It is estimated on the basis of field observations and laboratory data. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content, that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. The extent of shrinking and swelling is influenced by the amount and type of clay in the soil. A high shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material that has this rating. In general, soils classified as CH and A-7 have a moderate to high shrink-swell potential, and soils that have a low shrink-swell potential are clean sands and gravel and most other nonplastic to slightly plastic soils.

Engineering Interpretations

Table 6 shows soil-related limitations for selected uses and suitability ratings of soils for specific uses. It also notes specific soil features or characteristics that can affect selection, design, or application of treatment measurements. The listing of limitations, ratings, and features is based on information in table 5, "Estimated engineering properties of soils," and on field experience.

The degree and kinds of limitations for each soil in the county are shown for septic tank absorption fields, sewage lagoons, shallow excavations, dwellings without basements, sanitary landfills, local roads and streets, and light industry. This information can be used by community planners, developers, and individual landowners to determine the most suitable use for a particular area. The rating of *slight* indicates that the soil has no limitations or only slight limitations that are easy to overcome. A rating of *moderate* indicates that limitations can normally be overcome by good planning, careful design, and good management. A rating of *severe* indicates that limitations are difficult and costly to overcome and major reclamation is generally required.

Suitability ratings are shown for soils used as a source of roadfill and topsoil in terms of *good, fair,* and *poor,* which have, respectively, meanings approximately parallel to the terms slight, moderate, and severe. The ratings, reflect suitability of the soil as a source of road fill and topsoil, not response of the remaining soil once the roadfill or topsoil has been removed.

Soil features not to be overlooked in the planning, installation, and maintenance of pond reservoir areas; embankments, dikes, and levees; drainage of cropland and pasture; and terraces and diversions are listed for each soil in table 6.

Following are explanations of the columns in table 6.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability; depth to water table, rock, or other impervious layers; and susceptibility to flooding. If drainage is poor or flooding is frequent, other properties have little bearing on the rating. Slope affects difficulty of layout and construction and the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet long enough for bacteria to decompose the solids. Sewage lagoons require consideration of the soil as a vessel for the impounded area and as soil material for the dam or embankment. Adequate soil material suitable for the structure must be available. Also, when properly constructed, the lagoon must be capable of holding water with minimum seepage. A lagoon has a nearly level floor and sides, or embankments, of compacted soil material. The assumption is made that the embankment is compacted to medium density and the pond is protected from flooding. Properties that affect the pond floor and the embankment are considered. Those that affect the pond floor are permeability, organic matter, and slope. If the floor needs to be leveled, depth to bedrock is important. The soil properties that affect the embankment are the engineering properties of the embankment material, as interpreted from the Unified classification, and the amount of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Shallow excavations are those that require digging or trenching to a depth of less than 6 feet, for example, excavations for underground utility lines (pipelines, sewers, cables), cemeteries, basements, and open ditches. Soil properties considered in this use are depth to bedrock, stoniness, rockiness, water table, flooding, slope, and texture. Additional interpretations concerning shrink-swell potential and corrosivity are needed for rating the ultimate use of soils for pipelines.

Dwellings without basements, as rated in table 6, are single-family dwellings or other structures no

more than three stories high that are supported by foundation footings placed in undisturbed soil. In rating soils for dwellings, the emphasis is on the properties that affect foundations, but also considered are slope, susceptibility to flooding, seasonal wetness, and other hydrologic conditions. The properties that influence foundation support are those that affect bearing capacity and settlement under load, such as density, wetness, flooding, plasticity, texture, and shrink-swell potential. Also considered are soil properties, particularly depth to bedrock, that influence installation of utility lines. Onsite investigations are needed for specific placement of buildings and utility lines and for detailed design of foundations.

Sanitary landfills are areas for disposal refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfills are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. Criteria used to determine ratings for sanitary landfill are drainage, depth to water table, flooding, permeability, texture, slope, depth to bedrock, stoniness, and rockiness (fig. 22). Data in this survey cannot be substituted for geologic investigations because soil borings are normally limited to a depth of 5 to 6 feet, whereas many sanitary landfills are made to a depth of 10 to 15 feet. These interpretations are useful in making preliminary determinations of those sites that are not well suited to sanitary landfills, thus saving the time and expense of a more detailed investigation. They can also indicate potential sites where soils with favorable properties warrant additional investigation, because in some soils properties below a depth of 5 to 6 feet can be predicted with reasonable accuracy. The design engineer still needs to determine actual soil conditions to the depth necessary to obtain valid data for design purposes.

Local roads and streets, as rated in table 6, have some kind of all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 6 feet deep (fig. 23). Soil properties that most affect design and construction of roads and streets are the load-supporting capacity and stability of the subgrade and the workability and amount of cut and fill material available. The AASHTO and Unified classifications of the soil material and the shrink-swell potential give an indication of the load-supporting capacity. Wetness and flooding affect the stability of the material (fig. 24). Slope, depth to hard rock, stoniness, rockiness, and wetness affect the ease of excavation and the amount of cut and fill material needed to reach an even grade.

Light industry is limited to structures other than dwellings three stories or less in height. Ratings are for undisturbed soil that is used to support building foundations. Emphasis is on foundations and ease of excavation for underground utilities. Soil properties that affect load-supporting capacity and settlement under load are wetness, flooding, texture, plasticity, density, and shrink-swell potential (fig. 25). Properties that affect excavation are wetness, flooding, slope, and depth to bedrock.

Figure 22.—**A sanitary landfill in Cumberland soils. Depth to bedrock, drainage, and permeability are important soil properties to consider in selecting a site for this use.**

Figure 23.—**Interstate highway on Lomond silt loam, 2 to 5 percent slopes.**

Figure 24.—**Consideration of the flooding hazard of soils is important in selecting locations for roads.**

Road fill is soil material used for making embankments for roads. Because low embankments and the upper part of high embankments serve as the subgrade for roads, soil material for road fill also needs to be good for the subgrade. Suitability ratings are shown for the whole soil from the surface to a depth of 5 or 6 feet, based on the assumption that soil horizons will be mixed in loading, dumping, and spreading operations. The ratings reflect the predicted suitability of the soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage and, also, the relative ease of excavating the material at borrow areas. Soil properties considered in these ratings are the AASHTO and Unified classifications of the soil material, shrink-swell potential, slope, stoniness, rockiness, and drainage.

Topsoil has several meanings, but in these interpretations it means soil material used for topdressing areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material; natural fertility of the material, or the response of plants when fertilizer is applied; and the absence or presence of substances toxic to plants. Soil properties considered are texture, consistence, coarse fragments, stoniness, and rockiness. Also considered are certain features that affect the ease of excavating the material, particularly slope, wetness, and thickness of suitable material. Soils that have less than 8 inches of favorable material are considered unsuitable as a source of topsoil.

Pond reservoir areas are places where water is collected and stored. They are either excavated areas or areas where water is impounded behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability. Other factors that affect this use are depth to fractured or permeable bedrock or other permeable material and slope, which influences the water storage potential.

Embankments, dikes, and levees are raised structures of soil material used to retain, impound, or store water. These structures require soil material that is resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Other important factors are depth to bedrock and the presence of stones.

Drainage of cropland and pasture consists of the removal of excess water from soils. Soil features and qualities that should be considered in drainage of cropland and pasture are those that affect installation and performance of surface and subsurface

Figure 25.—**Soil properties that affect bearing capacity and settlement under load are important in selecting sites for industrial buildings and other structures.**

drainage systems. These are permeability, texture, and structure; depth to bedrock, fragipan, claypan, or other layers that influence the rate of water movement; depth to the water table; slope; stability in ditchbanks; susceptibility to flooding or ponding; and the availability of outlets for drainage.

Terraces and diversions are low ridges constructed across the slope to intercept or divert runoff so that it soaks into the soil or flows slowly to a prepared outlet. Factors to consider in the planning and construction of terraces and diversions are soil features and qualities that affect stability of the soil, layout and construction of the terraces and diversions, establishment and maintenance of vegetative cover, and sedimentation. Such soil properties are uniformity and steepness of slope; depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. Soils suitable for these structures also provide outlets for runoff and are not difficult to vegetate.

Use of the Soils for Woodland [4]

This section of the survey has been provided to explain how soils affect tree growth and management in Rutherford County. Originally, all of the county was wooded. In 1971 trees covered about 29 percent of the county, a decrease of more than 20,000 acres since 1961 (*9*).

Good stands of hardwoods and eastern redcedar are produced in the woodlands of the county. Eastern redcedar forest types make up 59 percent of the county's forest, mainly on rocky and eroded soils. Oak-hickory types generally predominate on the steeper soils. Ninety-seven percent of the woodland is owned by private individuals, chiefly farmers.

The economic value of the wood products is substantial, although it is below its potential. Other values include wildlife habitat, recreation, natural beauty, and conservation of soil and water.

Production of Wood Crops

The soils of Rutherford County have been assigned to 17 woodland groups. Groupings are based on the potential of the soils for production of wood crops and on soil characteristics that affect management. The soils in each group have about the same suitability for trees, are about the same in productivity, and have limitations that require similar management.

Table 7 shows the woodland groups, by group symbols; the soils in each group, by map symbols; the

[4] By C. M. HENNINGER, woodland conservationist, Soil Conservation Service.

TABLE 7.—*Suitability of the soils for trees*

Woodland groups, descriptions of soils, and map symbols	Potential productivity		Preferred species—	
	Species	Site index	To favor in existing stands	For planting
Group 2o7: Deep, well drained, nearly level to moderately steep soils; high available water capacity; high potential productivity; no serious management concerns. AmA, AmB, AmC, Ar, Ca, DeC, Eg, HcA, HcB, LoA, LoB.	Yellow-poplar White oak Loblolly pine Southern red oak	96–105 76–85 86–95 76–85	Yellow-poplar, white oak, black walnut, southern red oak.	Loblolly pine, black walnut, yellow-poplar, black locust.
Group 2w8: Deep, moderately well drained, nearly level soils; high available water capacity; high potential productivity; moderate equipment limitations because of wetness. Ly.	Yellow-poplar White oak Southern red oak Loblolly pine Sweetgum	96–105 76–85 76–85 86–95 86–95	Yellow-poplar, white oak, southern red oak, black walnut, white ash.	Yellow-poplar, black walnut, loblolly pine.
Group 2w9: Nearly level, poorly drained soils; high available water capacity; high potential productivity; severe equipment limitations and seedling mortality because of wetness. Ae, Ea, Me, Ro, Ru.	Sweetgum Loblolly pine Yellow-poplar Cottonwood Water oak	86–95 86–95 96–105 96–105 86–95	Sweetgum, white oak, willow oak, water oak, red maple, loblolly pine.	Loblolly pine, sweetgum, willow oak, water oak.
Group 2r8: Deep, well-drained, steep soils; high available water capacity; high potential productivity; moderate erosion hazard and moderate equipment limitations because of steep slopes. DeE, DeF.	Yellow-poplar White oak Loblolly pine Southern red oak	96–105 76–85 86–95 76–85	Yellow-poplar, white oak, black locust, southern red oak, black walnut.	Yellow-poplar, black walnut, black locust, loblolly pine.
Group 3o7: Deep, well drained and moderately well drained, gently sloping to moderately steep soils; medium to high available water capacity; moderately high productivity; no serious management concerns. BrA, BrB, BrC2, ByA, ByB, CpA, CpB, CuA, CuB, CuC2, HaB, HaC2, HaD2, MsC, MsD, NeA, NeB, StB, StC, StD.	Yellow-poplar Loblolly pine Shortleaf pine Redcedar White oak Southern red oak	86–95 76–85 66–75 46–55 66–75 66–75	Yellow-poplar, white oak, southern red oak, loblolly pine, shortleaf pine, Virginia pine.	Yellow-poplar, loblolly pine, shortleaf pine, Virginia pine.
Group 3w8: Nearly level, somewhat poorly drained soils that have a fragipan or a slowly permeable clayey subsoil; medium available water capacity; moderately high productivity; moderate equipment restrictions and seedling mortality because of wetness. Tu, Wo.	Yellow-poplar Sweetgum White oak	86–95 76–85 66–75	Yellow-poplar, sweetgum, loblolly pine, white oak.	Loblolly pine, sweetgum.
Group 3w9: Nearly level, poorly drained, slowly permeable soils; medium available water capacity; moderately high productivity; severe equipment restrictions and seedling mortality because of wetness. Do.	Sweetgum White oak Willow oak Water oak	76–85 66–75 76–85 76–85	Loblolly pine, sweetgum, willow oak, water oak.	Loblolly pine, sweetgum, willow oak, water oak.
Group 3c2: Moderately deep, well-drained, gently sloping to moderately steep soils; medium available water capacity; moderately high productivity; moderate equipment restrictions and seedling mortality because of high clay content. TaA, TaB2, TaC2.	Loblolly pine Shortleaf pine Redcedar Virginia pine	76–85 66–75 46–55 66–75	Redcedar, Virginia pine, loblolly pine, shortleaf pine.	Redcedar, Virginia pine, loblolly pine.
Group 3f8: Deep and moderately deep, well-drained, steep soils; low to medium available water capacity; moderately high productivity; slight to moderate erosion hazard and seedling mortality and moderate equipment restrictions because of coarse fragments and slope. BoC, HgC, HgD, ImC, SaD, SaE.	Yellow-poplar Loblolly pine Shortleaf pine Virginia pine Redcedar White oak Southern red oak Chestnut oak	86–95 76–85 66–75 66–75 46–55 66–75 66–75 66–75	Yellow-poplar, loblolly pine, shortleaf pine, Virginia pine, redcedar, white oak, southern red oak.	Loblolly pine, shortleaf pine, Virginia pine.

TABLE 7.—*Suitability of the soils for trees*—Continued

Woodland groups, descriptions of soils, and map symbols	Potential productivity		Preferred species—	
	Species	Site index	To favor in existing stands	For planting
Group 3r8: Deep and moderately deep, well-drained, steep soils; medium to high available water capacity; moderately high potential productivity; moderate erosion hazard and equipment limitations because of slope. MsE, StE.	Yellow-poplar Loblolly pine Shortleaf pine Redcedar White oak Southern red oak	86–95 76–85 66–75 46–55 66–75 66–75	Yellow-poplar, white oak, southern red oak, loblolly pine, shortleaf pine, Virginia pine.	Yellow-poplar, loblolly pine, shortleaf pine, Virginia pine.
Group 4o7: Moderately deep, well-drained, sloping and moderately steep soils; slowly permeable clayey subsoil; low available water capacity; moderate productivity; moderate erosion hazard, equipment restrictions, and seedling mortality because of soil depth and slope. AsC, AsD.	Redcedar Southern red oak Loblolly pine	40–50 50–60 66–75	Black locust, southern red oak, yellow-poplar, loblolly pine.	Redcedar, black locust, loblolly pine, Virginia pine.
Group 4x3: Moderately deep and shallow, well drained and moderately well drained, gently sloping to moderately steep soils that have many outcrops of limestone; low to medium available water capacity; moderate productivity; moderate to severe erosion hazard, equipment restrictions, and seedling mortality because of rock outcrops and slope. BtA, BtC, Df, MrD, MrE, TrC.	Redcedar Loblolly pine Shortleaf pine Virginia pine	36–45 66–75 56–65 56–65	Virginia pine, shortleaf pine, loblolly pine, southern red oak.	Virginia pine, redcedar, shortleaf pine, loblolly pine.
Group 4d3: Shallow, well-drained, sloping soils; low available water capacity; moderate productivity; moderate erosion hazard and equipment restrictions and moderate to severe seedling mortality because of shallow depth to rock. BaC.	Redcedar	36–45	Redcedar	Redcedar.
Group 4c3e: Moderately deep and deep, well-drained, steep and moderately steep, severely eroded soils; medium to low available water capacity; moderate productivity; moderate to severe erosion hazard, equipment restrictions, and seedling mortality because of high clay content. BsB3, BsC3, CvB3, CvC3, HbC3, HbD3, InE, TbB3, TbC3, TbD3.	Redcedar Virginia pine Loblolly pine Shortleaf pine	36–45 56–65 66–75 56–65	Redcedar, Virginia pine, loblolly pine, hackberry, chinkapin oak.	Redcedar, Virginia pine, loblolly pine.
Group 4f3: Deep, well-drained, steep cherty soils; low available water capacity; moderate productivity; moderate seedling mortality and severe erosion hazard and equipment restrictions because of coarse fragments and slope. BoE.	Virginia pine Redcedar Loblolly pine Chestnut oak	56–65 36–45 66–75 56–65	Loblolly pine, Virginia pine, redcedar.	Loblolly pine, Virginia pine, redcedar.
Group 5x3: Rock outcrops and shallow and moderately deep clayey soils; dominantly sloping and moderately steep; low productivity; severe management problems because of rock outcrops. GRC.	Redcedar	26–35	Redcedar	Redcedar.
Group 5c3e: Very severely eroded, dominantly clayey soils deeply cut by gullies; low productivity; severe management problems because of gullies. Gu.	Redcedar	26–35	Redcedar	Redcedar.

potential productivity of specific trees; and the preferred species, both in existing stands and for planting. The woodland group designation for each soil in the county is shown in the "Guide to Mapping Units" at the back of this survey.

The first number in the group symbol indicates the relative potential productivity of the soils in the group for wood crops. It expresses the site quality, which is based on the site index of one or more important forest types or species. The numeral *1* indicates that potential productivity is very high; *2* indicates high; *3*, moderately high; *4*, moderate; and *5*, low. The soils of Rutherford County have site quality of 2, 3, 4, or 5.

The second part of the symbol indicates an important soil property that imposes a hazard or limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive wetness; *d*, restricted rooting depth; *c*, too much clayey material in the profile; *f*, too many coarse fragments in the profile; *r*, excessive slope; and *o*, no significant limitation.

The third part of the symbol indicates the degree or hazard of limitation and the general suitability of the soils for certain kinds of trees. The numeral *1* indicates that the soils have no significant limitation and are better suited to needleleaf trees (pines or redcedar) than to others; *2* indicates that the soils have a slight to moderate limitation and are better suited to needleleaf trees than to others; *3* indicates that the soils have a moderate to severe limitation and are better suited to needleleaf trees than to others; *4* indicates that the soils have no significant limitation and are better suited to broadleaf trees than to others; *5* indicates that the soils have a slight to moderate limitation and are better suited to broadleaf trees than to others; *6* indicates that the soils have a moderate to severe limitation and are better suited to broadleaf trees than to others; *7* indicates that the soils have no significant limitation and are suited to both needleleaf and broadleaf trees; *8* indicates a slight to moderate limitation and suitability for both needleleaf and broadleaf trees; and *9* indicates a moderate to severe limitation and suitability for both needleleaf and broadleaf trees. The numeral *0* indicates that the soils are not suitable for the production of commercial wood crops. The soils of Rutherford County have the limitations and suitabilities indicated by numerals 2, 3, 7, 8, and 9.

Potential productivity.—The important wood crops for the soils of each group are listed under this heading, and each is rated according to site index range. Site index is the average height, in feet, that the dominant and codominant trees of a given species, growing on the specified soils, will reach in 50 years. The site index ranges given in this survey are based on measurements of trees of different species.

Preferred species.—The kinds of trees to be favored in management of existing stands and the kinds to be chosen for planting are listed under this heading. The trees listed are not in order of priority.

Management of the Soils for Wildlife Habitat

Table 8 shows the suitability of the soils in Rutherford County for seven elements of wildlife habitat and for three kinds of wildlife. Ratings refer only to the suitability of the soils. Not considered are the climate, the present land use, or the distribution of wildlife and people. The suitability of individual sites must be determined by onsite inspection.

The ratings and column headings used in table 8 are explained in the following paragraphs.

A rating of *good* means that habitat generally is easily created, improved, or maintained; the soil has few or no limitations that affect management; and satisfactory results can be expected. *Fair* means that habitat can be created, improved, or maintained in most places; the soil has moderate limitations that affect management; and moderately intensive management is generally needed for satisfactory results. A rating of *poor* means that habitat can be created, improved, or maintained only in some places; limitations are severe; habitat management is difficult and expensive; and results are not always satisfactory. *Very poor* means that habitat is impractical or impossible to create, improve, or maintain; and unsatisfactory results are probable.

Grain and seed crops are grain-producing or seed-producing annuals, such as corn, sorghum, millet, and soybeans.

Grasses and legumes are domestic grasses and legumes that are established by planting and that furnish food and cover for wildlife. They include tall fescue, orchardgrass, ryegrass, panicgrass, clover, annual lespedeza, and bush lespedeza.

Wild herbaceous upland plants are native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Examples are beggarweed, perennial lespedeza, wild beans, pokeberry, partridgepea, crotons, and cheatgrass.

Hardwood woody plants are nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, or foliage (browse). These plants, which are used extensively as food by wildlife, are commonly established naturally or may be planted. They include oak, beech, cherry, dogwood, viburnum, maple, grape, honeysuckle, greenwood, and autumn-olive.

Coniferous woody plants are cone-bearing trees and shrubs that are used mainly as cover but that also furnish food in the form of browse, seeds, or fruitlike cones. Examples are pine, hemlock, cedar, and ornamental plants.

Wetland food and cover plants are annual and perennial wild herbaceous plants on moist or wet sites. These plants do not include submerged or floating aquatic plants. They furnish food and cover used mostly by wetland wildlife. Examples are smartweed, wild millet, spikerush and other rushes, sedges, burseed, tearthumb, and aneilema.

Shallow-water developments are low dikes or other water control structures established to create habitat principally for waterfowl. They may be designed so

they can be drained, planted, and flooded; or they may be used as permanent impoundments for submerged aquatics.

Openland wildlife include cottontail rabbit, quail, dove, fox, meadowlark, field sparrow, and other birds and mammals that normally live on cropland, pasture, meadow, lawns, and in other openland areas where grasses, herbs, and shrubby plants grow.

Woodland wildlife include squirrel, woodcock, thrush, vireo, deer, grouse, raccoon, wild turkey, and other birds and mammals that normally live in wooded areas.

Wetland wildlife include mink, muskrat, duck, geese, rail, heron, shore birds, and other birds and mammals that normally live in marshes, swamps, and other wet areas.

Formation and Classification of the Soils

This section describes the major factors of soil formation, tells how these factors have affected the soils of Rutherford County, and explains some of the principal processes in horizon development. It also defines the current system for classifying soils and shows the classification of the soils by series and higher categories.

Factors of Soil Formation

Soil forms through the interaction of the five major soil-forming factors—climate, living organisms, parent material, topography, and time. Each of these factors affects the formation of every soil, but the relative importance of each factor differs from place to place.

Climate and vegetation are the active factors that change parent material gradually into soil. Relief modifies the effects of climate and vegetation mainly by its effect on runoff and temperature. The parent material also affects the kind of soil that is formed, and time is needed to change the parent material into soil.

Climate

The climate in Rutherford County is characterized by mild winters, warm summers, and abundant rainfall. Presumably, it is similar to the climate under which the soils formed. A more complete discussion of climate is in the section "General Nature of the County."

The warm, moist climate promotes rapid soil development. The warm temperatures permit rapid chemical reactions. Large amounts of water move through the soils and remove dissolved or suspended materials. Plant remains decompose rapidly, and in this way the organic acids hasten the development of clay minerals and the removal of carbonates. Leaching and soil development continue almost all year because the soil is frozen for only short periods and then only to a depth of 4 or 5 inches.

The climate is fairly uniform throughout the county; however, some local differences are caused by microrelief, slope, aspect, and drainage.

On the steep south- and west-facing slopes, annual and daily temperatures are higher, organic matter decomposes faster, and the freeze-thaw ratio is higher than on the north- and east-facing slopes. Because the freeze-thaw ratio is higher, there is more creep and soil erosion on the south- and west-facing slopes. Consequently, the soils are more shallow, have more rock outcrops, and are less productive than soils on the north- and east-facing slopes.

Living organisms

Plants, animals, insects, bacteria, and fungi are important in the formation of soils. They cause gains in organic-matter content and nitrogen, gains or losses in content of plant nutrients, and changes in structure and porosity.

Plants generally have a greater effect on soil formation than other living organisms. The native vegetation in this county was mostly hardwood mixed with cedars. Eastern redcedar and hickory were dominant on most rocky areas and on the shallow clayey soils. Before the area was settled, vast canebrakes flourished along many of the streams and on broad, flat, wet uplands. This, in part, accounts for the large tracts of poorly drained and somewhat poorly drained soils that have a thick, dark-colored surface layer.

Because of the climate and the rapid decomposition, most of the well drained and moderately well drained soils contain only a small amount of organic matter. Man has also greatly altered the original condition of many of the soils by clearing, draining, and cultivating and by introducing new species of plants.

Parent material

Parent material is the unconsolidated mass from which a soil forms. It determines the limits of the chemical and mineral composition of soil. In Rutherford County the parent material is residual material weathered from rocks and material transported by water, wind, or gravity, or a combination of these.

Rutherford County is divided physiographically into the Highland Rim and the Central Basin (*4*); however, most of the county is in the Central Basin. The Highland Rim consists of remnants of a dissected plain underlain by cherty limestone and shale that resist weathering (fig. 26). These remnants are on the crests and steep upper slopes of high hills and knobs. The Central Basin is underlain by relatively soluble limestone (fig. 27). The Central Basin is subdivided into the Outer Central Basin and the Inner Central Basin on the basis of content of phosphorus in the underlying limestone formation. Because of the content of phosphorus in the limestone, the soils of the Outer Central Basin are medium to high in content of phosphorus, and those of the Inner Central Basin are low.

Transported materials are general and local alluvium, either of which can be young or old. Alluvium that has been deposited recently now consists of material only slightly altered by the soil-forming processes.

TABLE 8.—*Potential of the soils for elements*

Soil	Potential for habitat elements			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Almaville: Ae	Poor	Fair	Fair	Fair
Armour:				
AmA, AmB	Good	Good	Good	Good
AmC	Fair	Good	Good	Good
Arrington: Ar	Good	Good	Good	Good
Ashwood:				
AsC	Fair	Good	Good	Good
AsD	Poor	Fair	Good	Good
Barfield: BaC	Poor	Poor	Poor	Poor
Bodine:				
BoC	Poor	Fair	Fair	Fair
BoE	Very poor	Poor	Fair	Fair
Bradyville:				
BrA, BrB, BsC3	Good	Good	Good	Good
BrC2, BsB3	Fair	Good	Good	Good
BtA, BtC	Poor	Fair	Fair	Fair
Bu too variable to be rated.				
Byler: ByA, ByB	Fair	Good	Good	Good
Cannon: Ca	Fair	Good	Good	Good
Capshaw: CpA, CpB	Fair	Good	Good	Good
Cumberland:				
CuA, CuB, CvB3	Good	Good	Good	Good
CuC2, CvC3	Fair	Good	Good	Good
Dellrose:				
DeC	Fair	Good	Good	Good
DeE	Poor	Fair	Good	Good
DeF	Very poor	Poor	Good	Good
Dilton: Df	Very poor	Poor	Poor	Poor
Dowellton: Do	Poor	Fair	Fair	Fair
Eagleville: Ea	Poor	Fair	Fair	Fair
Egam: Eg	Good	Good	Good	Good
Gladeville: GRC	Very poor	Very poor	Poor	Poor
Gullied land: Gu	Very poor	Very poor	Poor	Poor
Hampshire:				
HaB	Good	Good	Good	Good
HaC2, HbC3	Fair	Good	Good	Good
HaD2, HbD3	Poor	Fair	Good	Good
Harpeth: HcA, HcB	Good	Good	Good	Good
Hillwood: HgC, HgD	Poor	Fair	Fair	Poor
Inman: InC, InE	Poor	Fair	Fair	Poor
Lomond: LoA, LoB	Good	Good	Good	Good
Lynnville: Ly	Good	Good	Good	Good
Melvin: Me	Poor	Fair	Fair	Fair
Mimosa:				
MrD, MrE	Very poor	Fair	Fair	Fair
MsC	Fair	Good	Good	Good
MsD	Poor	Good	Good	Good
MsE	Very poor	Fair	Good	Good
Nesbitt: NeA, NeB	Good	Good	Good	Good
Pits and Dumps: Pd. Too variable to be rated.				
Roellen: Ro, Ru	Fair	Fair	Fair	Fair
Sandhill: SaD, SaE	Poor	Fair	Good	Good
Stiversville:				
StB	Good	Good	Good	Good
StC, StD	Fair	Good	Good	Good
StE	Poor	Fair	Good	Good
Talbott:				
TaA, TaB2, TaC2	Fair	Good	Good	Good
TbB3, TbC3	Fair	Fair	Fair	Good
TbD3	Poor	Fair	Fair	Fair
TrC	Very poor	Poor	Fair	Fair
Tupelo: Tu	Fair	Good	Good	Good
Woodmont: Wo	Fair	Good	Good	Good

of wildlife habitat and for kinds of wildlife

Potential for habitat elements—Continued			Potential as habitat for—		
Coniferous woody plants	Wetland food and cover plants	Shallow-water developments	Openland wildlife	Woodland wildlife	Wetland wildlife
Fair	Good	Good	Fair	Fair	Good.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Fair	Very poor.
Poor	Very poor	Very poor	Poor	Poor	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Very poor	Poor	Fair	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Fair	Poor	Very poor	Fair	Fair	Very poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Poor	Fair	Very poor.
Poor	Fair	Poor	Poor	Poor	Fair.
Fair	Good	Good	Fair	Fair	Good.
Fair	Good	Fair	Fair	Fair	Good.
Good	Fair	Fair	Good	Good	Fair.
Poor	Very poor	Very poor	Very poor	Poor	Very poor.
Poor	Very poor	Very poor	Poor	Poor	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Fair	Poor	Very poor.
Poor	Very poor	Very poor	Fair	Fair	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Fair	Poor	Good	Good	Poor.
Fair	Good	Good	Fair	Fair	Good.
Fair	Very poor	Very poor	Poor	Fair	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Very poor	Poor	Fair	Very poor.
Good	Fair	Fair	Good	Good	Fair.
Good	Fair	Fair	Good	Good	Fair.

Figure 26.—The Chattanooga Shale exposed by this roadcut is commonly recognized as the separation between the Highland Rim and the Central Basin. Bodine soils formed in cherty limestone like that at the top of the cut.

Older alluvium has been deposited long enough for horizon formation in the soils.

Much of the Inner Central Basin has deposits of old alluvium of varying thickness overlying limestone residuum. Many of the soils in this area formed partly in the old alluvium and partly in the underlying residuum. In many places loess appears to be mixed in the upper 1 foot to 2 feet of the alluvium. Young alluvium is generally on the flood plains of streams and in upland depressions. The Arrington, Lynnville, and Melvin soils are examples of soils that formed in young alluvium.

Topography

Topography, or relief, influences or modifies the effects of the other four soil-forming factors. Its influence on soil formation in Rutherford County is mainly through its effect on drainage, erosion, plant cover, and soil temperature.

Topography is determined mainly by the underlying bedrock, by the geologic history of the region, and by stream activity. The present topography of Rutherford County is a result of the arching of rock strata caused by the Cincinnati anticline and the subsequent geologic erosion of a plain that was originally the surface of the Highland Rim.

The steepest slopes and roughest terrain in the county are on the Highland Rim and in the Outer Central Basin, which parallel the eastern, southeastern, and western boundaries of the county. In these areas dissecting streams have formed deep hollows with steep-sided, narrow, winding ridgetops. There are also many high, isolated hills or knobs in the Inner Central Basin, some of which are capped with remnants of the Highland Rim. Slopes in these areas are as much as 45 percent. Relief in these areas is a dominant factor in soil formation. In general, the soils are well drained, are well aerated, and are red, yellow, or brown.

The relief of the Inner Central Basin is milder than that of other parts of the county. Slopes are mostly 0 to 15 percent. Where excess water drains away readily, the soils in the Inner Central Basin are dominantly red or brown, are well drained, and are well aerated. In low, nearly level and depressional areas from which

Figure 27.—**Most of the soils of Rutherford County are underlain by limestone like that exposed in this quarry.**

water drains slowly, the soils are poorly aerated and remain saturated for long periods; thus, the amount of iron in the profile is reduced, and the soils are gray. In addition to retarding oxidation, these conditions cause the environment to be unfavorable for many organisms and result in slow decomposition of organic matter. This factor, together with the type of vegetation, largely accounts for the large tracts of wet soils that have a thick, dark-colored surface layer.

Time

Generally, a long time is required for the formation of soils that have distinct horizons. Differences in the length of time parent material has been in place are commonly reflected in the degree of horizon development in the soil profile.

The Arrington and Armour soils are examples of soils that differ mainly because of differences in time. The Arrington soils do not have strongly developed horizons because the alluvial material has been in place only a short time. The Armour soils have been in place long enough for horizons to form. They have a B horizon that is redder and slightly more clayey than the A horizon. Carbonates have leached out, and the soil is strongly acid to medium acid, in contrast to the slightly acid to neutral Arrington soils, which are only slightly leached.

Processes of Soil Formation

Most soil profiles contain three major horizons—the A horizon, the B horizon, and the C horizon. The A horizon is the surface layer. It can be either the horizon of maximum organic matter, called the A1 horizon, or the horizon of maximum leaching of dissolved or suspended materials, called the A2 horizon.

The B horizon, which lies immediately beneath the A horizon, is called the subsoil. It is the horizon of maximum accumulation of dissolved or suspended materials, such as iron or clay. It is typically firmer than the layers just above and below it and commonly has blocky structure. The B horizon has not developed in young soils.

Below the B horizon is the C horizon, which is little affected by the soil-forming processes but which can be highly modified by weathering.

The formation of horizons in the soils of Rutherford County is the result of one or more of the following processes: the accumulation of organic matter, the leaching of calcium carbonates and bases, the reduction and transfer of iron, and the formation and translocation of silicate clay minerals. In most of the soils, more than one of these processes has been active in the formation of horizons.

The accumulation of organic matter in the upper part of the profile is important because this accumulation results in the formation of an A1 horizon. Most of the well-drained soils in this county are medium to low in organic-matter content. Some of the wet, poorly aerated soils have medium to high organic-matter content.

Carbonates and bases have been leached from most of the soils in the county. The leaching of bases generally precedes the translocation of silicate clay minerals. Some of the soils in the county are moderately to strongly leached.

The reduction and transfer of iron, a process called gleying, is evident in the poorly drained soils in Rutherford County. Gleying is indicated by gray color in the subsoil and indicates the reduction and loss of iron. Some horizons contain reddish-brown mottles and concretions, which are an indicator of segregation of iron.

The translocation of clay minerals has contributed to horizon development in many of the soils in the county. The eluviated A2 horizon, which is above the B horizon, has a granular structure and is less clayey and lighter in color than the B horizon. The B horizon has accumulations of clay and clay films in pores and on ped faces. Soils of this kind were probably highly leached of carbonates and soluble salts before translocation of silicate clays took place. The leaching of bases and the subsequent translocation of silicate clay are among the most important processes in horizon differentiation that have taken place in the soils of Rutherford County.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*3*) and revised later (*6*). The system currently used by the National Cooperative Soil Survey was developed in the early 1960's (*5*) and adopted in 1965 (*8*). It is under continual study.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria used for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 9 shows the classification of each soil series of Rutherford County by family, subgroup, and order, according to the current system. The classes that make up the current system are defined briefly in the following paragraphs.

ORDER.—Ten soil orders are recognized in the current system of classification. They are Alfisols, Aridisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols, and Vertisols. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. Three exceptions are Entisols, Histosols, and Inceptisols, which occur in many climates.

Five of the orders are represented in Rutherford County—Alfisols, Entisols, Inceptisols, Mollisols, and Ultisols. Alfisols have an accumulation of aluminum and iron, argillic or natric horizons, and a base saturation of more than 35 percent. Entisols are recent soils in which there has been little, if any, horizon development. Inceptisols are mineral soils that formed mostly in young but not recent material. Mollisols are mineral soils that have a thick, dark-colored surface layer, moderate to strong structure, and a base saturation of more than 50 percent. Ultisols have a clay-enriched B horizon that has less than 35 percent base saturation, which decreases with increasing depth.

SUBORDER.—Each order is divided into suborders, mainly on the basis of soil characteristics that produce classes that have the greatest genetic similarity. A suborder has a narrower climatic range than an order. The criteria for suborders reflect either the presence or absence of waterlogging or soil differences that result from climate or vegetation.

GREAT GROUP.—Each suborder is divided into great groups on the basis of uniformity in kind and sequence of genetic horizons.

SUBGROUP.—Each great group is divided into subgroups, one that represents the central (typic) concept of the group, and others, called intergrades, made up of soils that have mostly the properties of one great group but also one or more properties of another great group.

FAMILY.—Families are established within subgroups, mainly on the basis of properties important to plant growth. Some of these properties are texture, mineralogy, reaction, soil temperature, permeability, consistence, and thickness of horizons.

SERIES.—Soils that have profiles almost alike make up a soil series. The soil series has the narrowest range in characteristics of the categories in the classification system. Except for difference in texture of the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Channery soil. A soil that contains thin, flat fragments of sandstone, limestone, or schist, as much as 6 inches in length along the longer axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Compressible. The soil is relatively soft. It decreases excessively in volume when a load is applied.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some

TABLE 9.—*Soil series classified according to the current system*

Series	Family	Subgroup	Order
Almaville	Fine-silty, siliceous, thermic	Typic Fragiaqualfs	Alfisols.
Armour	Fine-silty, mixed, thermic	Ultic Hapludalfs	Alfisols.
Arrington	Fine-silty, mixed, thermic	Cumulic Hapludolls	Mollisols.
Ashwood	Fine, mixed, thermic	Typic Argiudolls	Mollisols.
Barfield	Clayey, mixed, thermic	Lithic Hapludolls	Mollisols.
Bodine	Loamy-skeletal, siliceous, thermic	Typic Paleudults	Ultisols.
Bradyville	Fine, mixed, thermic	Typic Hapludalfs	Alfisols.
Byler	Fine-silty, siliceous, thermic	Typic Fragiudalfs	Alfisols.
Cannon	Fine-loamy, mixed, thermic	Cumulic Hapludolls	Mollisols.
Capshaw	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols.
Cumberland	Fine, mixed, thermic	Rhodic Paleudalfs	Alfisols.
Dellrose	Fine-loamy, mixed, thermic	Humic Hapludults	Ultisols.
Dilton	Clayey, mixed, thermic	Lithic Haplaquolls	Mollisols.
Dowellton	Very fine, mixed, thermic	Vertic Ochraqualfs	Alfisols.
Eagleville	Fine, montmorillonitic, thermic	Fluvaquentic Haplaquolls	Mollisols.
Egam	Fine, mixed, thermic	Cumulic Hapludolls	Mollisols.
Gladeville	Clayey-skeletal, mixed, thermic	Lithic Rendolls	Mollisols.
Hampshire	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols.
Harpeth	Fine-silty, mixed, thermic	Humic Hapludults	Ultisols.
Hillwood	Clayey-skeletal, mixed, thermic	Typic Paleudalfs	Alfisols.
Inman	Fine, mixed, thermic	Ruptic-Alfic Eutrochrepts	Inceptisols.
Lomond	Fine-silty, siliceous, thermic	Mollic Paleudalfs	Alfisols.
Lynnville	Fine-silty, mixed, thermic	Fluvaquentic Hapludolls	Mollisols.
Melvin	Fine-silty, mixed, nonacid, mesic	Typic Fluvaquents	Entisols.
Mimosa	Fine, mixed, thermic	Typic Hapludalfs	Alfisols.
Nesbitt	Fine-silty, siliceous, thermic	Aquic Paleudalfs	Alfisols.
Roellen	Fine, montmorillonitic, thermic	Vertic Haplaquolls	Alfisols.
Sandhill	Fine-loamy, mixed, thermic	Ultic Hapludalfs	Alfisols.
Stiversville	Fine-loamy, mixed, thermic	Ultic Hapludalfs	Alfisols.
Talbott	Fine, mixed, thermic	Typic Hapludalfs	Alfisols.
Tupelo	Fine, mixed, thermic	Aquic Hapludalfs	Alfisols.
Woodmont	Fine-silty, siliceous, thermic	Glossaquic Fragiudalfs	Alfisols.

concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Creep, soil. The downward movement of masses of soil and soil material, primarily through the action of gravity. The movement, generally slow and irregular, occurs most commonly when the lower part of the soil is nearly saturated with water, and it may be facilitated by alternate freezing and thawing.

Depth to rock. Bedrock is so near the surface that it affects specified use of the soil.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Favorable. Features of the soil are favorable for the intended use.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable,

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by the accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state. In engineering, a high liquid limit indicates that the soil has a high content of clay and a low capacity for supporting loads.

Loess. Fine-grained material, dominantly of silt-sized particles, that has been deposited by wind.

Low strength. The soil has inadequate strength to support loads.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical mineral, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Percs slowly. Water moves through the soil slowly, affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Phase, soil. A subdivision of a soil, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil series, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects its management but not its behavior in the natural landscape.

pH value. A numerical means for designating acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Piping. The soil is susceptible to the formation of tunnels or pipelike cavities by moving water.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Poor outlets. Surface or subsurface drainage outlets are difficult or expensive to install.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Relief. The elevations or inequalities of a land surface, considered collectively.

Residual material. Unconsolidated, partly weathered mineral material that accumulates over disintegrating solid rock. Residual material is not soil but is frequently the material in which a soil has formed.

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

Root zone. The part of the soil that is penetrated, or can be penetrated, by plant roots.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains

consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Second bottom. The first terrace above the normal flood plain of a stream.

Seepage. Water moves through the soil so quickly that it affects the specified use.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Shrink-swell. The soil expands on wetting and shrinks on drying, which may cause damage to roads, dams, building foundations, or other structures.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Small stones. Rock fragments that are less than 10 inches across may affect the specified use.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Suitable soil material is not thick enough for use as borrow material or topsoil.

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series of which it is a part. For complete information about a capability unit, read both the introduction to the section "Use of the Soils for Crops and Pasture" and the description of the capability unit in that section. For information about the suitability of soils for woodland and wildlife habitat, read the introduction to those sections and refer to the tables in each section.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland group
			Symbol	Page	Number
Ae	Almaville silt loam	16	IVw-1	58	2w9
AmA	Armour silt loam, 0 to 2 percent slopes	17	I-1	53	2o7
AmB	Armour silt loam, 2 to 5 percent slopes	17	IIe-1	54	2o7
AmC	Armour silt loam, 5 to 12 percent slopes	17	IIIe-1	56	2o7
Ar	Arrington silt loam	18	I-1	53	2o7
AsC	Ashwood silty clay loam, 5 to 12 percent slopes	18	IVe-3	57	4o7
AsD	Ashwood silty clay loam, 12 to 20 percent slopes	18	VIe-2	58	4o7
BaC	Barfield silty clay loam, 1 to 8 percent slopes	19	VIe-2	58	4d3
BoC	Bodine cherty silt loam, 5 to 15 percent slopes	20	IVs-1	57	3f8
BoE	Bodine cherty silt loam, 20 to 45 percent slopes	20	VIIs-1	60	4f3
BrA	Bradyville silt loam, 0 to 2 percent slopes	20	I-2	53	3o7
BrB	Bradyville silt loam, 2 to 5 percent slopes	21	IIe-2	54	3o7
BrC2	Bradyville silt loam, 5 to 12 percent slopes, eroded	21	IIIe-2	56	3o7
BsB3	Bradyville silty clay loam, 2 to 5 percent slopes, severely eroded	21	IIIe-2	56	4c3e
BsC3	Bradyville silty clay loam, 5 to 12 percent slopes, severely eroded	21	IVe-2	57	4c3e
BtA	Bradyville-Rock outcrop complex, 0 to 2 percent slopes	22	IVs-2	58	4x3
BtC	Bradyville-Rock outcrop complex, 2 to 12 percent slopes	22	VIs-2	59	4x3
Bu	Bradyville-Urban land complex	22	------	--	----
ByA	Byler silt loam, 0 to 2 percent slopes	24	IIw-1	55	3o7
ByB	Byler silt loam, 2 to 5 percent slopes	24	IIe-3	55	3o7
Ca	Cannon cherty silt loam	24	IIs-1	55	2o7
CpA	Capshaw silt loam, 0 to 2 percent slopes	25	IIw-1	55	3o7
CpB	Capshaw silt loam, 2 to 5 percent slopes	25	IIe-3	55	3o7
CuA	Cumberland silt loam, 0 to 2 percent slopes	26	I-2	53	3o7
CuB	Cumberland silt loam, 2 to 5 percent slopes	26	IIe-2	54	3o7
CuC2	Cumberland silt loam, 5 to 12 percent slopes, eroded	26	IIIe-2	56	3o7
CvB3	Cumberland silty clay loam, 2 to 5 percent slopes, severely eroded	27	IIIe-2	56	4c3e
CvC3	Cumberland silty clay loam, 5 to 12 percent slopes, severely eroded	27	IVe-2	57	4c3e
DeC	Dellrose cherty silt loam, 5 to 12 percent slopes	28	IIIe-1	56	2o7
DeE	Dellrose cherty silt loam, 12 to 30 percent slopes	28	VIe-1	58	2r8
DeF	Dellrose cherty silt loam, 30 to 40 percent slopes	28	VIe-1	58	2r8
Df	Dilton-Rock outcrop complex	29	VIs-1	59	4x3
Do	Dowellton silt loam	29	IVw-1	58	3w9
Ea	Eagleville silty clay loam	30	IIIw-1	56	2w9
Eg	Egam silt loam	31	IIw-2	55	2o7
GRC	Gladeville-Rock outcrop-Talbott association, rolling	31	VIIs-1	60	5x3
Gu	Gullied land	31	VIIs-1	60	5c3e
HaB	Hampshire silt loam, 2 to 5 percent slopes	33	IIIe-3	56	3o7
HaC2	Hampshire silt loam, 5 to 12 percent slopes, eroded	34	IVe-3	57	3o7
HaD2	Hampshire silt loam, 12 to 20 percent slopes, eroded	34	VIe-2	58	3o7
HbC3	Hampshire silty clay loam, 5 to 12 percent slopes, severely eroded	34	VIe-2	58	4c3e
HbD3	Hampshire silty clay loam, 12 to 20 percent slopes, severely eroded	34	VIe-2	58	4c3e
HcA	Harpeth silt loam, 0 to 2 percent slopes	35	I-1	53	2o7
HcB	Harpeth silt loam, 2 to 5 percent slopes	35	IIe-1	54	2o7
HgC	Hillwood gravelly silt loam, 2 to 12 percent slopes	36	IVs-1	57	3f8
HgD	Hillwood gravelly silt loam, 12 to 20 percent slopes	37	VIs-1	59	3f8
ImC	Inman flaggy silt loam, 5 to 12 percent slopes	37	IVe-3	57	3f8
InE	Inman flaggy silty clay loam, 12 to 30 percent slopes	38	VIe-2	58	4c3e
LoA	Lomond silt loam, 0 to 2 percent slopes	38	I-1	53	2o7
LoB	Lomond silt loam, 2 to 5 percent slopes	39	IIe-1	54	2o7
Ly	Lynnville silt loam	39	IIw-2	55	2w8
Me	Melvin silt loam	40	IIIw-1	56	2w9
MrD	Mimosa-Rock outcrop complex, 5 to 20 percent slopes	41	VIs-2	59	4x3

Map symbol	Mapping unit	Described on page	Capability unit		Woodland group
			Symbol	Page	Number
MrE	Mimosa-Rock outcrop complex, 20 to 40 percent slopes	41	VIIs-1	60	4x3
MsC	Mimosa soils, 5 to 12 percent slopes	41	IVe-3	57	3o7
MsD	Mimosa soils, 12 to 20 percent slopes	41	VIe-2	58	3o7
MsE	Mimosa soils, 20 to 30 percent slopes	42	VIe-2	58	3r8
NeA	Nesbitt silt loam, 0 to 2 percent slopes	42	I-1	53	3o7
NeB	Nesbitt silt loam, 2 to 5 percent slopes	43	IIe-1	54	3o7
Pd	Pits and Dumps	43	------	--	----
Ro	Roellen silty clay loam	44	IIIw-1	56	2w9
Ru	Roellen silty clay	44	IIIw-1	56	2w9
SaD	Sandhill channery loam, 12 to 20 percent slopes	45	VIs-1	59	3f8
SaE	Sandhill channery loam, 20 to 30 percent slopes	46	VIIs-1	60	3f8
StB	Stiversville silt loam, 2 to 5 percent slopes	46	IIe-1	54	3o7
StC	Stiversville silt loam, 5 to 12 percent slopes	47	IIIe-1	56	3o7
StD	Stiversville silt loam, 12 to 20 percent slopes	47	IVe-1	57	3o7
StE	Stiversville silt loam, 20 to 40 percent slopes	47	VIe-1	58	3r8
TaA	Talbott silt loam, 0 to 2 percent slopes	48	IIe-2	54	3c2
TaB2	Talbott silt loam, 2 to 5 percent slopes, eroded	48	IIIe-3	56	3c2
TaC2	Talbott silt loam, 5 to 12 percent slopes, eroded	48	IVe-3	57	3c2
TbB3	Talbott silty clay loam, 2 to 5 percent slopes, severely eroded	49	IVe-3	57	4c3e
TbC3	Talbott silty clay loam, 5 to 12 percent slopes, severely eroded	50	VIe-2	58	4c3e
TbD3	Talbott silty clay loam, 12 to 20 percent slopes, severely eroded	50	VIe-2	58	4c3e
TrC	Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes	50	VIs-2	59	4x3
Tu	Tupelo silt loam	51	IIIw-2	56	3w8
Wo	Woodmont silt loam	52	IIIw-2	56	3w8

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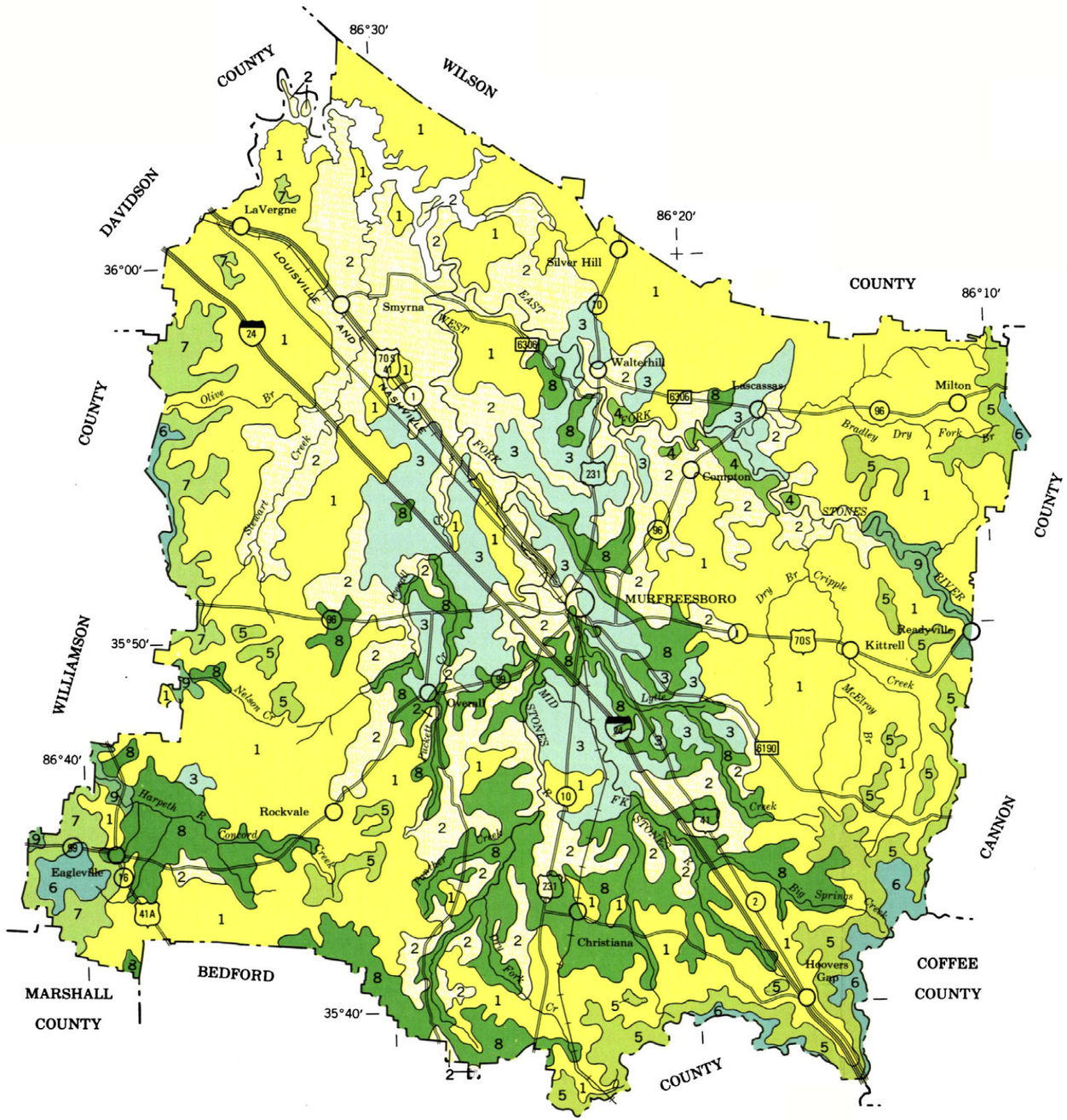


Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SOIL ASSOCIATIONS

1. Rock outcrop-Talbott-Barfield association: Limestone outcrops and well-drained, nearly level to moderately steep soils that have a clayey subsoil; on uplands
2. Bradyville-Lomond-Talbott association: Well-drained, nearly level to moderately steep soils that have a reddish clayey or loamy subsoil; on uplands
3. Lomond-Cumberland association: Well-drained, nearly level to sloping soils that have a reddish loamy or clayey subsoil; on uplands
4. Hillwood-Talbott association: Well-drained, gently sloping to moderately steep soils that have a reddish gravelly and very gravelly, loamy and clayey subsoil or a reddish clayey subsoil; on uplands
5. Rock outcrop-Mimosa-Inman association: Limestone outcrops and well-drained, sloping to steep phosphatic soils that have a clayey subsoil; on uplands
6. Dellrose-Mimosa-Bodine association: Well-drained and excessively drained, sloping to steep cherty soils that have a loamy or clayey subsoil; on uplands
7. Stiversville-Sandhill-Inman association: Well-drained, gently sloping to steep phosphatic soils that have a loamy or clayey subsoil; on uplands
8. Roellen-Tupelo-Capshaw association: Poorly drained to moderately well drained, nearly level to gently sloping soils that have a clayey subsoil; on bottom lands, low stream terraces, and uplands
9. Armour-Arrington-Egam association: Well drained and moderately well drained, nearly level to sloping soils that have a loamy or clayey subsoil; mainly on bottom lands and stream terraces

Compiled 1976

N

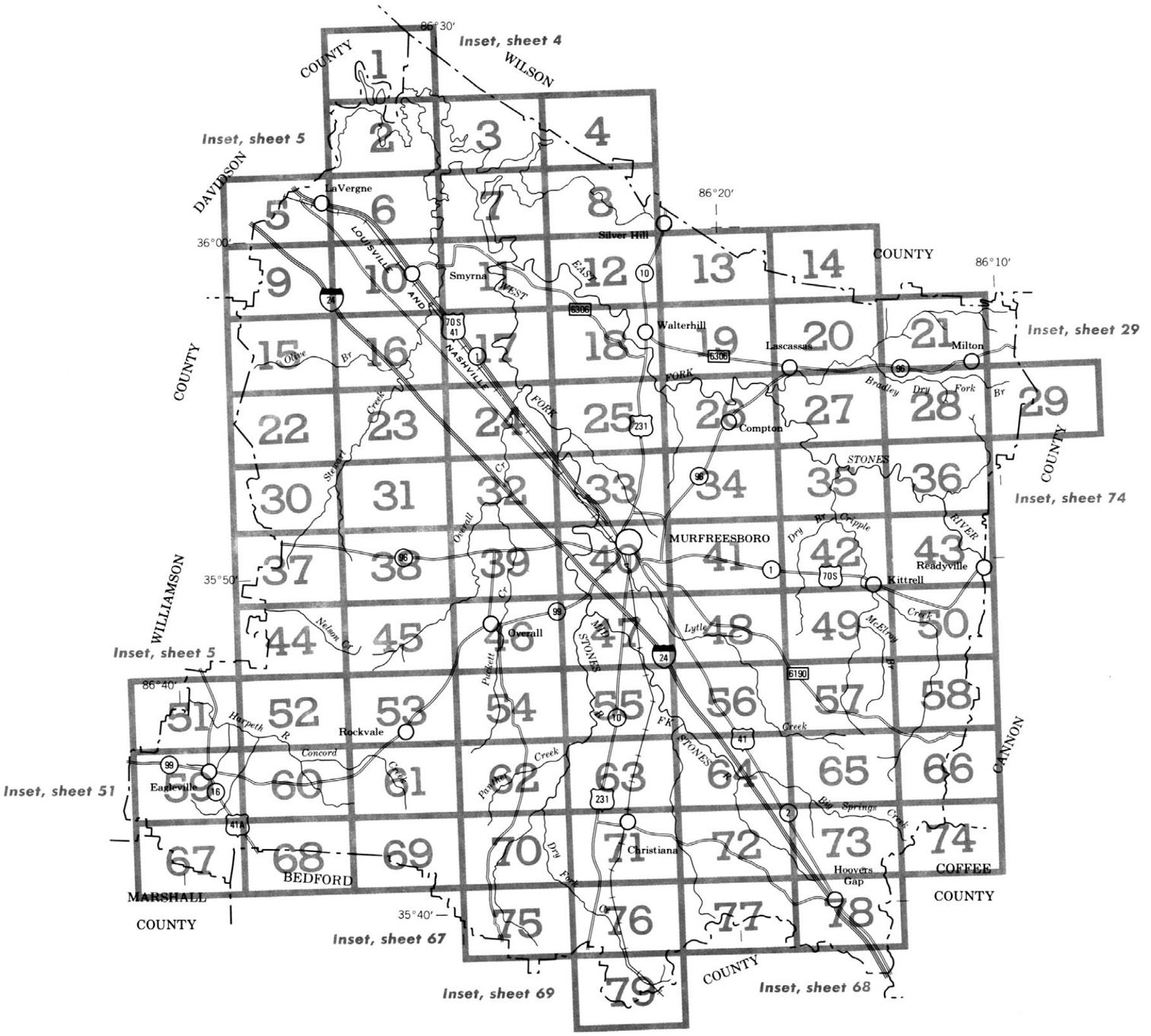
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF TENNESSEE AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

RUTHERFORD COUNTY, TENNESSEE

Scale 1:253,440
1 0 1 2 3 4 Miles

Original text from each map sheet:
"This map is compiled on 1974 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned."



N

INDEX TO MAP SHEETS

RUTHERFORD COUNTY, TENNESSEE

Scale 1:253,440

1 0 1 2 3 4 Miles

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is lowercase for a detailed unit and is a capital letter for a reconnaissance unit. 1/ The third letter, if used, is a capital letter and connotes slope class. Symbols without a slope letter are for nearly level soils. A final number in the symbol designates erosion; 2 for moderately eroded, 3 for severely eroded.

SYMBOL	NAME
Ae	Almaville silt loam
AmA	Armour silt loam, 0 to 2 percent slopes
AmB	Armour silt loam, 2 to 5 percent slopes
AmC	Armour silt loam, 5 to 12 percent slopes
Ar	Arrington silt loam
AsC	Ashwood silty clay loam, 5 to 12 percent slopes
AsD	Ashwood silty clay loam, 12 to 20 percent slopes
BaC	Barfield silty clay loam, 1 to 8 percent slopes
BoC	Bodine cherty silt loam, 5 to 15 percent slopes
BoE	Bodine cherty silt loam, 20 to 45 percent slopes
BrA	Bradyville silt loam, 0 to 2 percent slopes
BrB	Bradyville silt loam, 2 to 5 percent slopes
BrC2	Bradyville silt loam, 5 to 12 percent slopes, eroded
BsB3	Bradyville silty clay loam, 2 to 5 percent slopes, severely eroded
BsC3	Bradyville silty clay loam, 5 to 12 percent slopes, severely eroded
BtA	Bradyville-Rock outcrop complex, 0 to 2 percent slopes
BtC	Bradyville-Rock outcrop complex, 2 to 12 percent slopes
Bu	Bradyville-Urban land complex
ByA	Byler silt loam, 0 to 2 percent slopes
ByB	Byler silt loam, 2 to 5 percent slopes
Ca	Cannon cherty silt loam
CpA	Capshaw silt loam, 0 to 2 percent slopes
CpB	Capshaw silt loam, 2 to 5 percent slopes
CuA	Cumberland silt loam, 0 to 2 percent slopes
CuB	Cumberland silt loam, 2 to 5 percent slopes
CuC2	Cumberland silt loam, 5 to 12 percent slopes, eroded
CvB3	Cumberland silty clay loam, 2 to 5 percent slopes, severely eroded
CvC3	Cumberland silty clay loam, 5 to 12 percent slopes, severely eroded
DeC	Dellrose cherty silt loam, 5 to 12 percent slopes
DeE	Dellrose cherty silt loam, 12 to 30 percent slopes
DeF	Dellrose cherty silt loam, 30 to 40 percent slopes
Df	Dilton-Rock outcrop complex
Do	Dowellton silt loam
Ea	Eagleville silty clay loam
Eg	Egam silt loam
GRC	Gladeville-Rock outcrop-Talbott association, rolling
Gu	Gullied land
HaB	Hampshire silt loam, 2 to 5 percent slopes
HaC2	Hampshire silt loam, 5 to 12 percent slopes, eroded
HaD2	Hampshire silt loam, 12 to 20 percent slopes
HbC3	Hampshire silty clay loam, 5 to 12 percent slopes, severely eroded
HbD3	Hampshire silty clay loam, 12 to 20 percent slopes, severely eroded
HcA	Harpeth silt loam, 0 to 2 percent slopes
HcB	Harpeth silt loam, 2 to 5 percent slopes
HgC	Hillwood gravelly silt loam, 2 to 12 percent slopes
HgD	Hillwood gravelly silt loam, 12 to 20 percent slopes
ImC	Inman flaggy silt loam, 5 to 12 percent slopes
InE	Inman flaggy silty clay loam, 12 to 30 percent slopes
LoA	Lomond silt loam, 0 to 2 percent slopes
LoB	Lomond silt loam, 2 to 5 percent slopes
Ly	Lynnville silt loam
Me	Melvin silt loam
MrD	Mimosa-Rock outcrop complex, 5 to 20 percent slopes
MrE	Mimosa-Rock outcrop complex, 20 to 40 percent slopes
MsC	Mimosa soils, 5 to 12 percent slopes
MsD	Mimosa soils, 12 to 20 percent slopes
MsE	Mimosa soils, 20 to 30 percent slopes
NeA	Nesbitt silt loam, 0 to 2 percent slopes
NeB	Nesbitt silt loam, 2 to 5 percent slopes
Pd	Pits and Dumps
Ro	Roellen silty clay loam
Ru	Roellen silty clay
SaD.	Sandhill channery loam, 12 to 20 percent slopes
SaE	Sandhill channery loam, 20 to 30 percent slopes
StB	Stiversville silt loam, 2 to 5 percent slopes
StC	Stiversville silt loam, 5 to 12 percent slopes
StD	Stiversville silt loam, 12 to 20 percent slopes
StE	Stiversville silt loam, 20 to 40 percent slopes
TaA	Talbott silt loam, 0 to 2 percent slopes
TaB2	Talbott silt loam, 2 to 5 percent slopes, eroded
TaC2	Talbott silt loam, 5 to 12 percent slopes, eroded
TbB3	Talbott silty clay loam, 2 to 5 percent slopes, severely eroded
TbC3	Talbott silty clay loam, 5 to 12 percent slopes, severely eroded
TbD3	Talbott silty clay loam, 12 to 20 percent slopes, severely eroded
TrC	Talbott-Barfield-Rock outcrop complex, 2 to 12 percent slopes
Tu	Tupelo silt loam
Wo	Woodmont silt loam

1/ Reconnaissance units indicate the delineations are larger and the composition of the unit is apt to be more variable than for other units in the survey area. Mapping has been controlled well enough, however, for the anticipated use of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Davis Airstrip; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate (79)
- Federal (410)
- State (52)
- County, farm or ranch (378)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (GAS)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water)
- Intermittent (int)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Weli, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (CeA FoB2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 1

1 850 000 FEET

620 000 FEET

610 000 FEET

1 835 000 FEET

J PERCY PRIEST RESERVOIR

DAVIDSON COUNTY

WILSON COUNTY

Bryant Creek

Bald Knob

(Joins inset, sheet 4)

(Joins sheet 2)

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 0 5 000 ¾ 4 000 ½ 3 000 ¼ 2 000 0 1 000

2

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 1)

1 850 000 FEET

605 000 FEET

DAVIDSON COUNTY

DAVIDSON COUNTY

DAVIDSON COUNTY

PERCY PRIEST RESERVOIR

Reservoir

Reservoir

Reservoir

water

water

Creek

(Joins sheet 3)

(Joins inset B, sheet 5)

(Joins sheet 6)

1 835 000 FEET

600 000 FEET

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 3

(Joins inset, sheet 4)

1 855 000 FEET

610 000 FEET

(Joins sheet 2)

(Joins sheet 7)

1 870 000 FEET

(Joins sheet 4)

600 000 FEET

Reservoir

PERCY PRIEST RESERVOIR

WILSON COUNTY

SPRING CREEK

3

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 4

4

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

1 890 000 FEET

1 860 000 FEET

610 000 FEET

615 000 FEET

600 000 FEET

1 875 000 FEET

1 855 000 FEET

(Joins sheet 1)

(Joins sheet 3)

(Joins sheet 8)

WILSON COUNTY

SPRING CREEK

PERCY PRIEST RESERVOIR

INSET A

1 805 000 FEET

511 000 FEET

WILLIAMSON COUNTY

HARPETH RIVER

(Joins sheet 44)

595 000 FEET

507 000 FEET

1 810 000 FEET

(Joins sheet 51)

5000 AND 4000-FOOT GRID TICKS

(Joins inset B)

Hurricane Creek

LOUISVILLE AND NASHVILLE

LA VERGNE

1 815 000 FEET

DAVIDSON COUNTY

West Branch

East Branch

(Joins sheet 6)

585 000 FEET

1 830 000 FEET

(Joins sheet 9)

INSET B

1 831000 FEET

698 000 FEET

559 000 FEET

1 832 000 FEET

1000-FOOT GRID TICKS

(Joins upper right)

(Joins sheet 2)

5

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

6

N

1 Mile 5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 2)

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 10)

1 850 000 FEET

595 000 FEET

1 835 000 FEET

LA VERGNE

SMYRNA AIR FIELD

J PERCY PRIEST RESERVOIR

Finch Branch

Eg Branch

AND CREEK

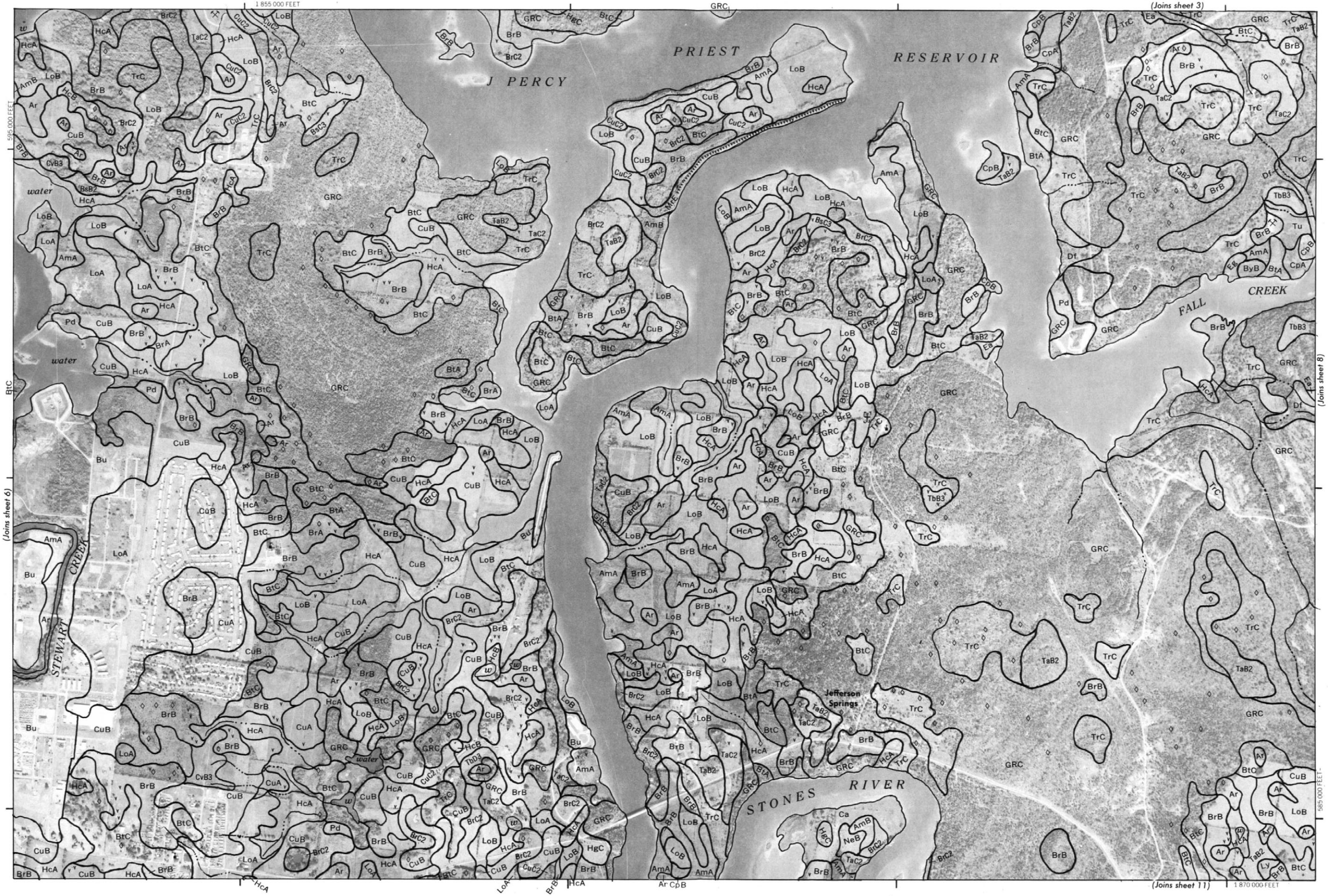
STEWART CREEK

NASHVILLE

LOUISVILLE

70S 41

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 7



RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 8

8

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 4)

(Joins sheet 7)

(Joins sheet 12)

(Joins inset, sheet 14)

1 890 000 FEET

595 000 FEET

585 000 FEET

1 875 000 FEET

FALL CREEK

WILSON COUNTY

MRE

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 9

10

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 4 000

1 5 000

(Joins sheet 6)

1 850 000 FEET

580 000 FEET

(Joins sheet 9)

575 000 FEET

(Joins sheet 11)

(Joins sheet 16)

1 835 000 FEET

Smyrna

Hilltop

Britton Hill

Moor Hill

STEWART CREEK

Spring Branch

Rock Creek


1 855 000 FEET
580 000 FEET
(Joins sheet 7)
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 17)
1 870 000 FEET
J PERCY PRIEST RESERVOIR
EAST FORK
WEST FORK
STONES RIVER
STEWART CREEK
Old Jefferson
N
1 Mile
5 000 Feet
Scale 1:15 840

12

N

Scale 1:15 840

1 Mile 5 000 Feet

(Joins sheet 8)

1 890 000 FEET

580 000 FEET

575 000 FEET

(Joins sheet 11)

(Joins sheet 13)

(Joins sheet 18)

1 875 000 FEET

Mona

EAST FORK STONES RIVER

water

GRC

(Joins inset, sheet 14)

1 895 000 FEET

580 000 FEET

(Joins sheet 12)

WILSON COUNTY

Vaughters Knob

Wades Branch

(Joins sheet 14)

575 000 FEET

(Joins sheet 19)

1 910 000 FEET

13

N

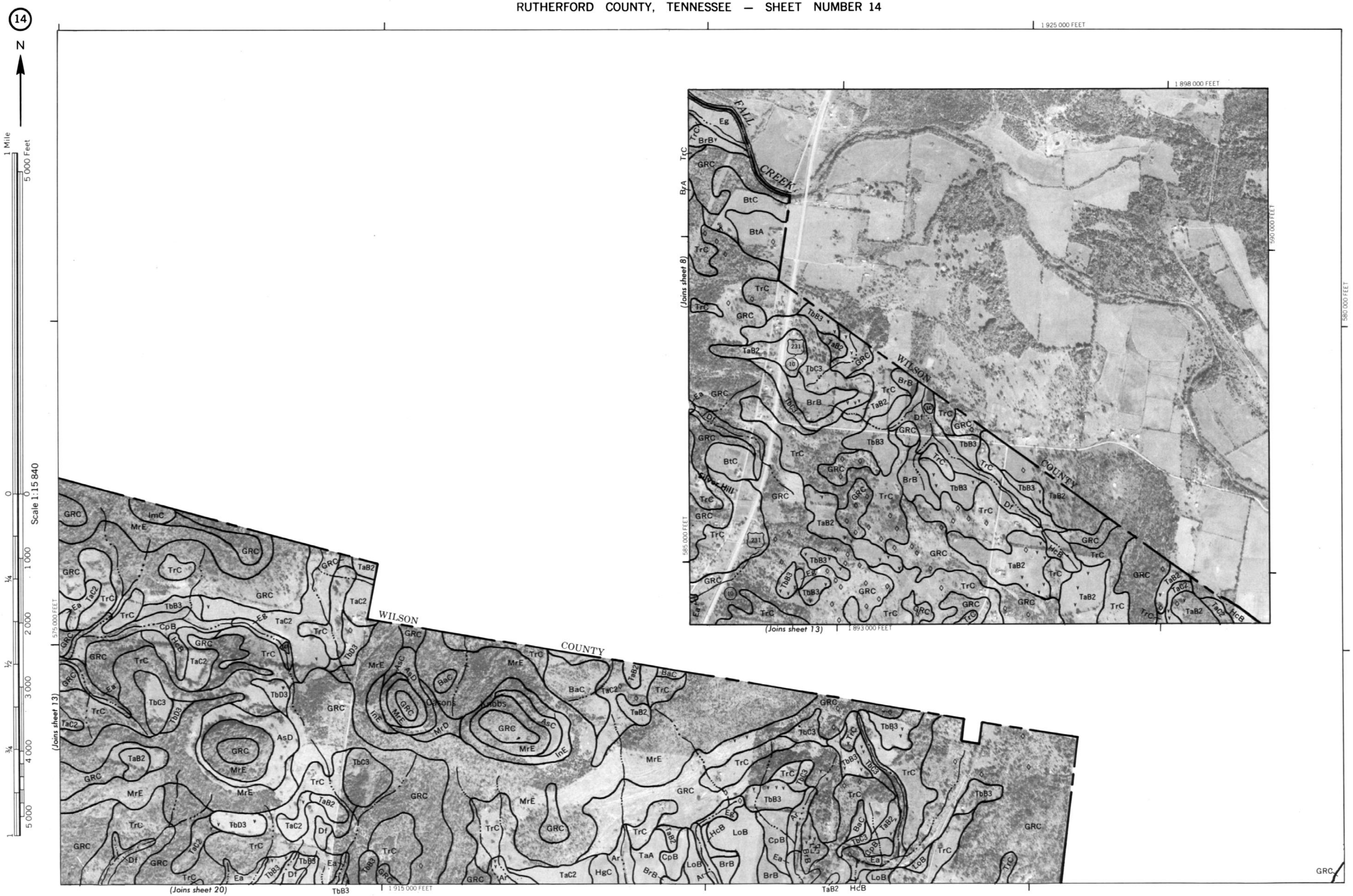
1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000


14
N
Scale 1:15 840
1 Mile
5 000 Feet
FALL CREEK
WILSON COUNTY
(Joins sheet 8)
(Joins sheet 13)
(Joins sheet 20)
1 925 000 FEET
1 898 000 FEET
590 000 FEET
580 000 FEET
585 000 FEET
575 000 FEET
1 893 000 FEET
1 915 000 FEET


1 815 000 FEET
570 000 FEET
(Joins sheet 9)
WILLIAMSON COUNTY
Flag Hill
Spring Branch
Rock Creek
Olive Branch
Rocky Fork Creek
(Joins sheet 16)
(Joins sheet 22)
1 830 000 FEET
560 000 FEET
15
N
1 Mile
5 000 Feet
Scale 1:15 840
0
5 000
1 000
2 000
3 000
4 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 16

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 17

17

N

1 Mile

5 000 Feet

Scale 1:15 840

1 855 000 FEET

570 000 FEET

560 000 FEET

1 870 000 FEET

(Joins sheet 11)

(Joins sheet 18)

(Joins sheet 16)

(Joins sheet 24)

WEST FORK STONES RIVER

LOUISVILLE AND NASHVILLE

18

N

Scale 1:15 840

1 Mile 5 000 Feet

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 12)

(Joins sheet 17)

(Joins sheet 25)

(Joins sheet 19)

1 890 000 FEET

570 000 FEET

560 000 FEET

1 875 000 FEET

EAST FORK STONES RIVER

Walterhill

Bethel

Wades Branch

(19)

N

1 Mile

5 000 Feet

Scale 1:15 840

1 895 000 FEET

570 000 FEET

560 000 FEET

1 910 000 FEET

(Joins sheet 13)

(Joins sheet 18)

(Joins sheet 20)

(Joins sheet 26)

Woods

Branch

Rucker Knob

EAST FORK STONES RIVER

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 20

20

N

(Joins sheet 14)

1 925 000 FEET

570 000 FEET

WILSON COUNTY

(Joins sheet 19)

560 000 FEET

Rucker Knob

Loscassas

Lotton

BRADLEY CREEK

Tarman Branch

Jarnagin Branch

Bradley Creek

Dry Creek

Fork

(Joins sheet 21)

(Joins sheet 27)

1 915 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

(Joins inset B, sheet 74)

1 930 000 FEET

570 000 FEET

(Joins sheet 20)

(Joins inset, sheet 29)

1 945 000 FEET

(Joins sheet 28)

560 000 FEET

WILSON COUNTY

BRADLEY

CREEK

Milton

21

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 22

22

N

Scale 1:15 840

1 Mile 5 000 Feet

1 830 000 FEET

555 000 FEET

550 000 FEET

1 815 000 FEET

(Joins sheet 15)

(Joins sheet 23)

(Joins sheet 30)

WILLIAMSON COUNTY

Rocky Fork Creek

water

Signal Knob

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 23

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 24

24

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 17)

(Joins sheet 23)

(Joins sheet 32)

(Joins sheet 25)

1 870 000 FEET

555 000 FEET

550 000 FEET

1 855 000 FEET

WEST FORK STONES RIVER

OVERALL CREEK

LOUISVILLE AND NASHVILLE

water

41 70S


1 875 000 FEET
555 000 FEET
(Joins sheet 18)
(Joins sheet 24)
(Joins sheet 26)
(Joins sheet 33)
1 890 000 FEET
550 000 FEET
EAST FORK STONES RIVER
WEST FORK STONES RIVER
Sinking Cr.
Dry Branch
U. S. VETERANS HOSPITAL
25
N
1 Mile
5 000 Feet
Scale 1:15 840

26

N

1 Mile

5 000 Feet

Scale 1:15 840

0 . 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

(Joins sheet 19)

(Joins sheet 25)

(Joins sheet 27)

(Joins sheet 34)

1 910 000 FEET

1 895 000 FEET

555 000 FEET

EAST FORK STONES RIVER

Bradley Creek

Bushman

Compton

Bear Branch

Brad Branch


1 915 000 FEET
555 000 FEET
TaB2 (Joins sheet 20)
(Joins sheet 28)
(Joins sheet 26)
1 925 000 FEET
(Joins sheet 35)
BRADLEY CREEK
EAST STONES FORK
STONES RIVER
Buzzard Roost
27
N
1 Mile
5 000 Feet
Scale 1:15 840
0
1/4
1/2
3/4
1
1 000
2 000
3 000
4 000
5 000
580 000 FEET

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 28

28

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 21)

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 36)

1 945 000 FEET

960 000 FEET

555 000 FEET

1 930 000 FEET


(Joins inset, lower right)
(Joins inset A, sheet 74)
(Joins sheet 28)
(Joins sheet 21)
(Joins upper left)
1 950 000 FEET
1 955 000 FEET
555 000 FEET
550 000 FEET
570 000 FEET
560 000 FEET
CANNON COUNTY
WILSON COUNTY
29
N
1 Mile
5 000 Feet
Scale 1:15 840
0
¼
½
¾
1
1 000
2 000
3 000
4 000
5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 30

30

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 22)

1 830 000 FEET

545 000 FEET

535 000 FEET

1 815 000 FEET

(Joins sheet 37)

(Joins sheet 31)

WILLIAMSON COUNTY

Almaville

Stewart Creek


(Joins sheet 23)
1 850 000 FEET
545 000 FEET
(Joins sheet 32)
(Joins sheet 30)
535 000 FEET
1 835 000 FEET
(Joins sheet 38)
Stewart Creek
Persimmon Knob
Gibbs Knob
N
1 Mile
5 000 Feet
Scale 1:15 840

32

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 24)

(Joins sheet 31)

(Joins sheet 39)

(Joins sheet 33)

1 870 000 FEET

545 000 FEET

1 835 000 FEET

1 855 000 FEET

Blackman

OVERALL CREEK

Puckett Creek

STONES RIVER NATIONAL MILITARY PARK

NASHVILLE AND LOUISVILLE

water

(Joins sheet 25)

(Joins sheet 34)

(Joins sheet 32)

(Joins sheet 40)

1 875 000 FEET

545 000 FEET

1 890 000 FEET

535 000 FEET

MURFREESBORO
(county seat)

WEST FORK STONES RIVER

Sinking Creek

NASHVILLE

33

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 34

34

N

(Joins sheet 26)

(Joins sheet 33)

(Joins sheet 41)

(Joins sheet 35)

1 Mile

5 000 Feet

Scale 1:15 840

1 910 000 FEET

1 895 000 FEET

545 000 FEET

535 000 FEET

Creek

Branch

Bushman

Shiloh

35

N

1 915 000 FEET

1 925 000 FEET

545 000 FEET

535 000 FEET

(Joins sheet 27)

(Joins sheet 36)

(Joins sheet 34)

(Joins sheet 42)

Sharpsville

Wolf Hill

EAST FORK STONES RIVER

CRIPPLE CREEK

1 Mile

5 000 Feet

Scale 1:15 840

36

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 28)

1 945 000 FEET

645 000 FEET

(Joins sheet 35)

(Joins inset A, sheet 74)

535 000 FEET

1 930 000 FEET

(Joins sheet 43)

EAST FORK STONES RIVER

Trimble Branch

McKnight Branch

Halls Mill

CANNON COUNTY

N

1 815 000 FEET

530 000 FEET

(Joins sheet 30)

(Joins sheet 38)

(Joins sheet 44)

1 830 000 FEET

520 000 FEET

COUNTY

WILLIAMSON

Scales Mountain

Indian Mountain

Patterson

Nelson Creek

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 38

38

N

(Joins sheet 31)

1 850 000 FEET

(Joins sheet 37)

1 Mile

5 000 Feet

Scale 1:15 840

1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

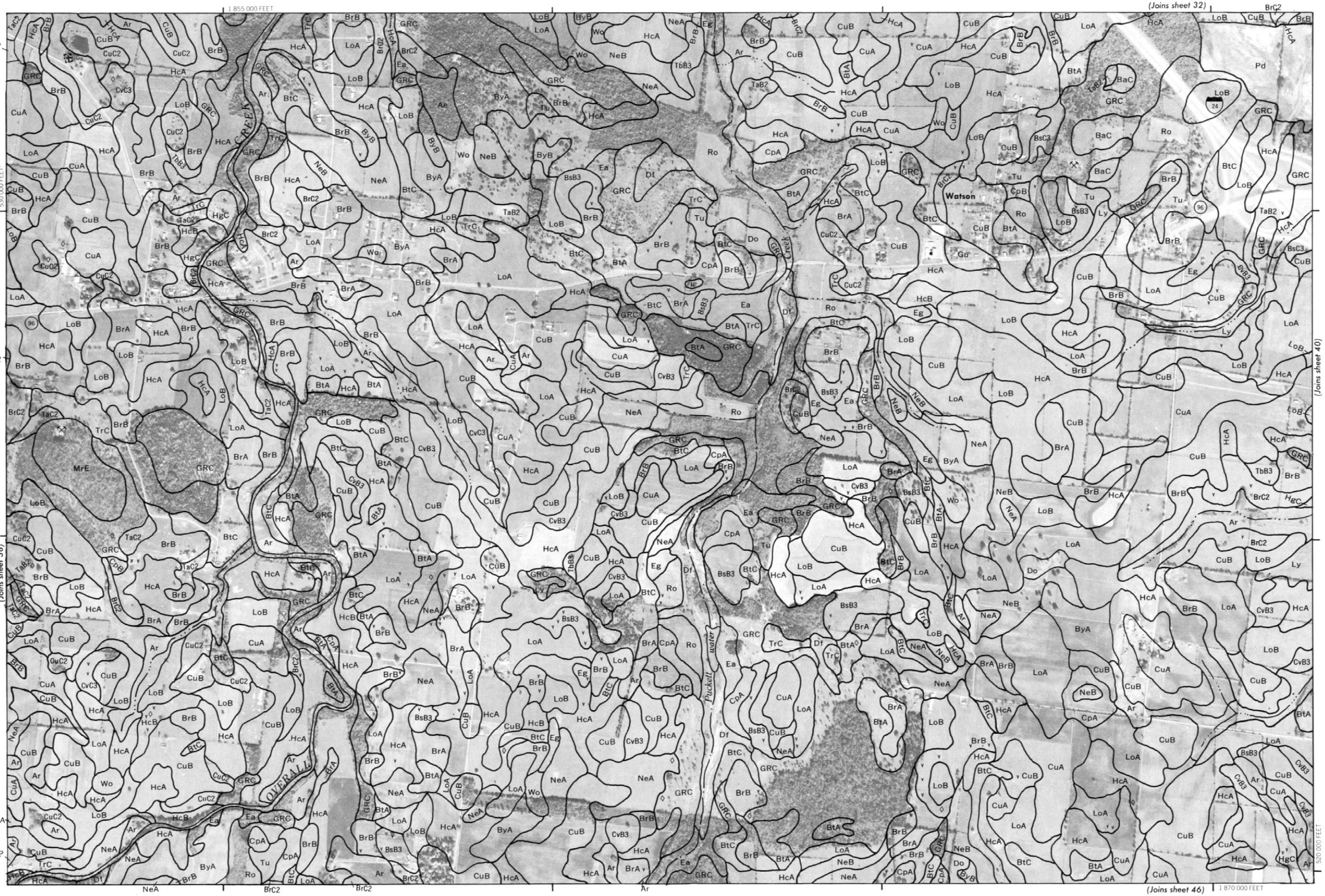
530 000 FEET

(Joins sheet 39)

520 000 FEET

(Joins sheet 45)

1 835 000 FEET


1 855 000 FEET
(Joins sheet 32)
530 000 FEET
(Joins sheet 38)
(Joins sheet 40)
(Joins sheet 46)
1 870 000 FEET
520 000 FEET
Watson
Puckett Creek
Overall Creek
Scale 1:15 840
1 Mile
5 000 Feet

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 40

40

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 33)

(Joins sheet 39)

(Joins sheet 41)

(Joins sheet 47)

1 890 000 FEET

530 000 FEET

1 875 000 FEET

520 000 FEET

MURFREESBORO
(county seat)

STONES RIVER

WEST FORK

Lytle Creek

Sinking Creek

Todds Lake

NASHVILLE AND

41

N

1 895 000 FEET

530 000 FEET

(Joins sheet 34)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 48)

1 910 000 FEET

520 000 FEET

MURFREESBORO
(county seat)

Double Spring Branch

1 Mile
5 000 Feet

Scale 1:15 840

0 1 000 2 000 3 000 4 000 5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 42

42

N

(Joins sheet 35)

1 925 000 FEET

(Joins sheet 41)

(Joins sheet 43)

1 Mile 5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

620 000 FEET

530 000 FEET

(Joins sheet 49)

1 915 000 FEET

(Joins sheet 36)

(Joins sheet 42)

(Joins sheet 50)

1 930 000 FEET

530 000 FEET

1 945 000 FEET

520 000 FEET

43

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

Andrews Creek

EAST FORK STONES RIVER

CANNON COUNTY

Pilot Knob

Readyville

70S

(44)

N

1 Mile 5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 37)

(Joins sheet 45)

(Joins sheet 52)

(Joins inset A, sheet 5)

1 830 000 FEET

1 815 000 FEET

510 000 FEET

515 000 FEET

WILLIAMSON COUNTY

Nelson Creek

Windrow Branch

Cole Knob

Cedar Grove

45

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

46

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 39)

(Joins sheet 45)

(Joins sheet 47)

(Joins sheet 54)

1 870 000 FEET

515 000 FEET

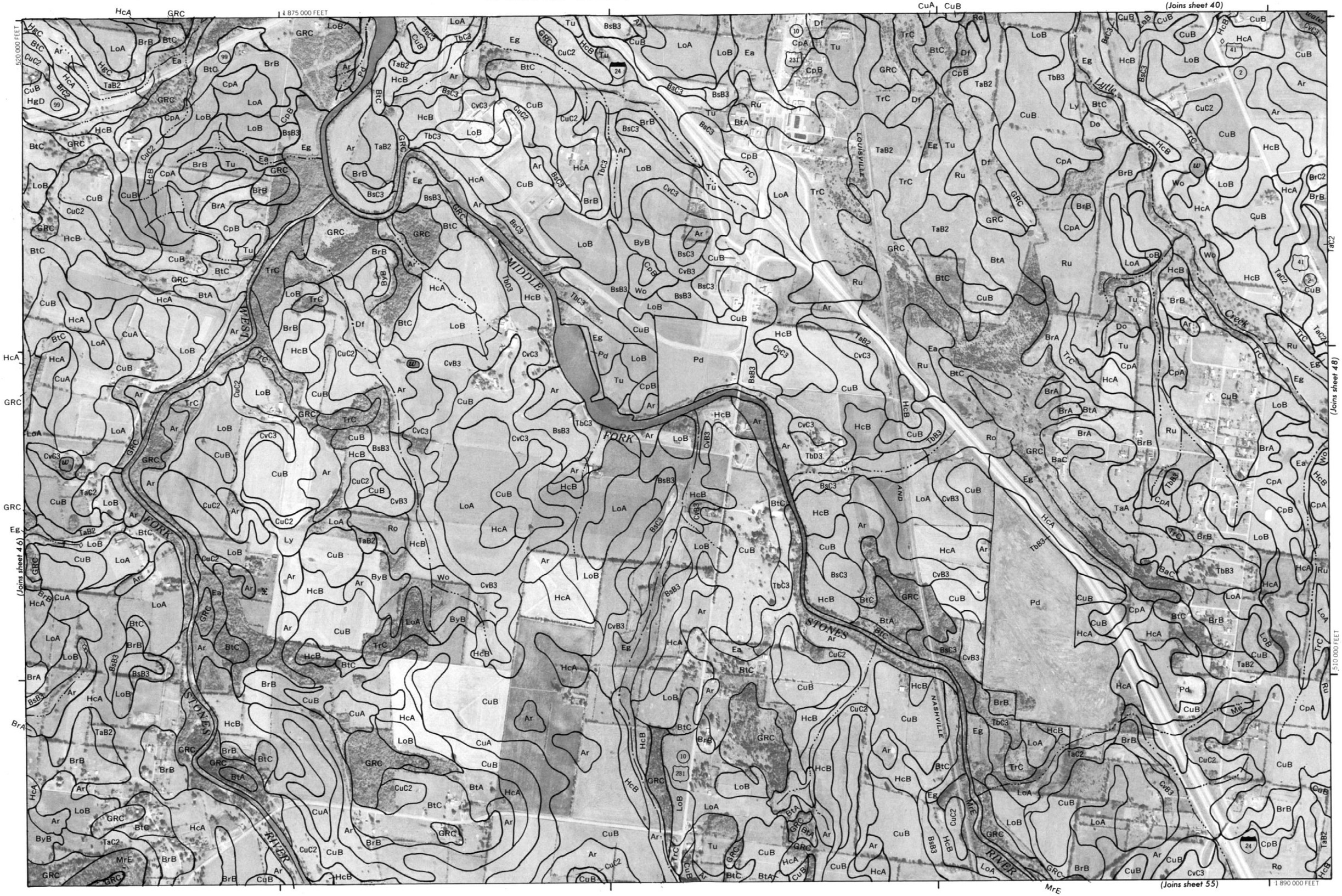
510 000 FEET

1 855 000 FEET

Overall Creek

Puckett Branch

Arms Pond Branch


520 000 FEET
1 875 000 FEET
(Joins sheet 40)
(Joins sheet 46)
(Joins sheet 48)
(Joins sheet 55)
1 890 000 FEET
1 510 000 FEET
MIDDLE FORK
WEST FORK
STONES RIVER
LITTLE CREEK
LOUISVILLE AND NASHVILLE
MrE
TaC2
47
N
1 Mile
5 000 Feet
Scale 1:15 840
0
¼
½
¾
1
1 000
2 000
3 000
4 000
5 000

48

N

(Joins sheet 41)

1 910 000 FEET

520 000 FEET

(Joins sheet 47)

(Joins sheet 49)

Scale 1:15 840

1 Mile

5 000 Feet

Todds Lake

Lytle Creek

Dillton

Mankinville

510 000 FEET

(Joins sheet 56)

1 895 000 FEET

(Joins sheet 42)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 57)

1 915 000 FEET

1 925 000 FEET

520 000 FEET

510 000 FEET

49

N

Scale 1:15 840

1 Mile

5 000 Feet

0 1 000 2 000 3 000 4 000 5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 50

50

N

(Joins sheet 43)

(Joins sheet 49)

(Joins sheet 58)

1 945 000 FEET

1 930 000 FEET

520 000 FEET

510 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

Peaks Hill

GRIPPLE CREEK

CANNON COUNTY

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 51

51

N

1 Mile
5 000 Feet

Scale 1:15 840

1 795 000 FEET
1 792 000 FEET
505 000 FEET
490 000 FEET
485 000 FEET
1 810 000 FEET
1 793 000 FEET
1 794 000 FEET
496 000 FEET
495 000 FEET
1000 AND 5000-FOOT GRID TICKS
1000-FOOT GRID TICKS

(Joins inset B)
(Joins inset A)
(Joins inset A, sheet 5)
(Joins inset lower left)
(Joins sheet 59)
(Joins sheet 52)
(Joins sheet 59)

INSET A
INSET B

WILLIAMSON COUNTY
HARPETH RIVER
Harpeth River
Creetham Branch

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 52

52

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 44)

(Joins sheet 51)

(Joins sheet 53)

(Joins sheet 60)

1 830 000 FEET

1 815 000 FEET

505 000 FEET

495 000 FEET

Cedar Grove

Pleasant Hill

HARPETH RIVER

Kelley Creek

N

1 835 000 FEET

505 000 FEET

(Joins sheet 52)

(Joins sheet 45)

(Joins sheet 54)

1 850 000 FEET (Joins sheet 61)

495 000 FEET

Rowling Hill

Jarrett Knob

Rockvale

Garrett Knob

1 Mile

5 000 Feet

Scale 1:15 840

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 54

54

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 46)

(Joins sheet 53)

(Joins sheet 62)

(Joins sheet 55)

1 870 000 FEET

1 855 000 FEET

505 000 FEET

495 000 FEET

BARFIELD KNOBS

Armstrong Branch

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 55

55

N

1 Mile

5 000 Feet

Scale 1:15 840

1 875 000 FEET

1 890 000 FEET

505 000 FEET

495 000 FEET

(Joins sheet 47)

(Joins sheet 56)

(Joins sheet 54)

(Joins sheet 63)

BARFIELD KNOBS

WEST FORK

MARSHALL KNOBS

STONES RIVER

MIDDLE FORK

LOUISVILLE AND NASHVILLE

Pd

Df

56

N

(Joins sheet 48)

(Joins sheet 55)

(Joins sheet 64)

(Joins sheet 57)

1 910 000 FEET

1 895 000 FEET

495 000 FEET

505 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

MIDDLE FORK STONES RIVER

Long Creek

Lytle Creek


1 915 000 FEET
(Joins sheet 49)
495 000 FEET
(Joins sheet 56)
(Joins sheet 58)
(Joins sheet 65)
1 930 000 FEET
Pleasant View
Murray Branch
Mc Elroy Branch
Gowen Knob
57
N
1 Mile
5 000 Feet
Scale 1:15 840

58

N

(Joins sheet 50) Gu

1 945 000 FEET

505 000 FEET

(Joins sheet 57)

CRIPPLE CREEK

Reed Creek

CANNON COUNTY

1 930 000 FEET

Eg (Joins sheet 66)

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

495 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

1 795 000 FEET

1 810 000 FEET

485 000 FEET

430 000 FEET

(Joins sheet 51)

(Joins sheet 60)

(Joins sheet 67)

(Joins inset A, sheet 51)

Eagleville

Wallace Hill

Cheatham Creek

Spring Creek

West Fork Kelley Creek

WILLIAMSON COUNTY

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 60

60

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1/4 1/2 3/4 1

5 000 4 000 3 000 2 000 1 000 0

(Joins sheet 52)

(Joins sheet 59)

(Joins sheet 61)

(Joins sheet 68)

1 830 000 FEET

1 815 000 FEET

490 000 FEET

485 000 FEET

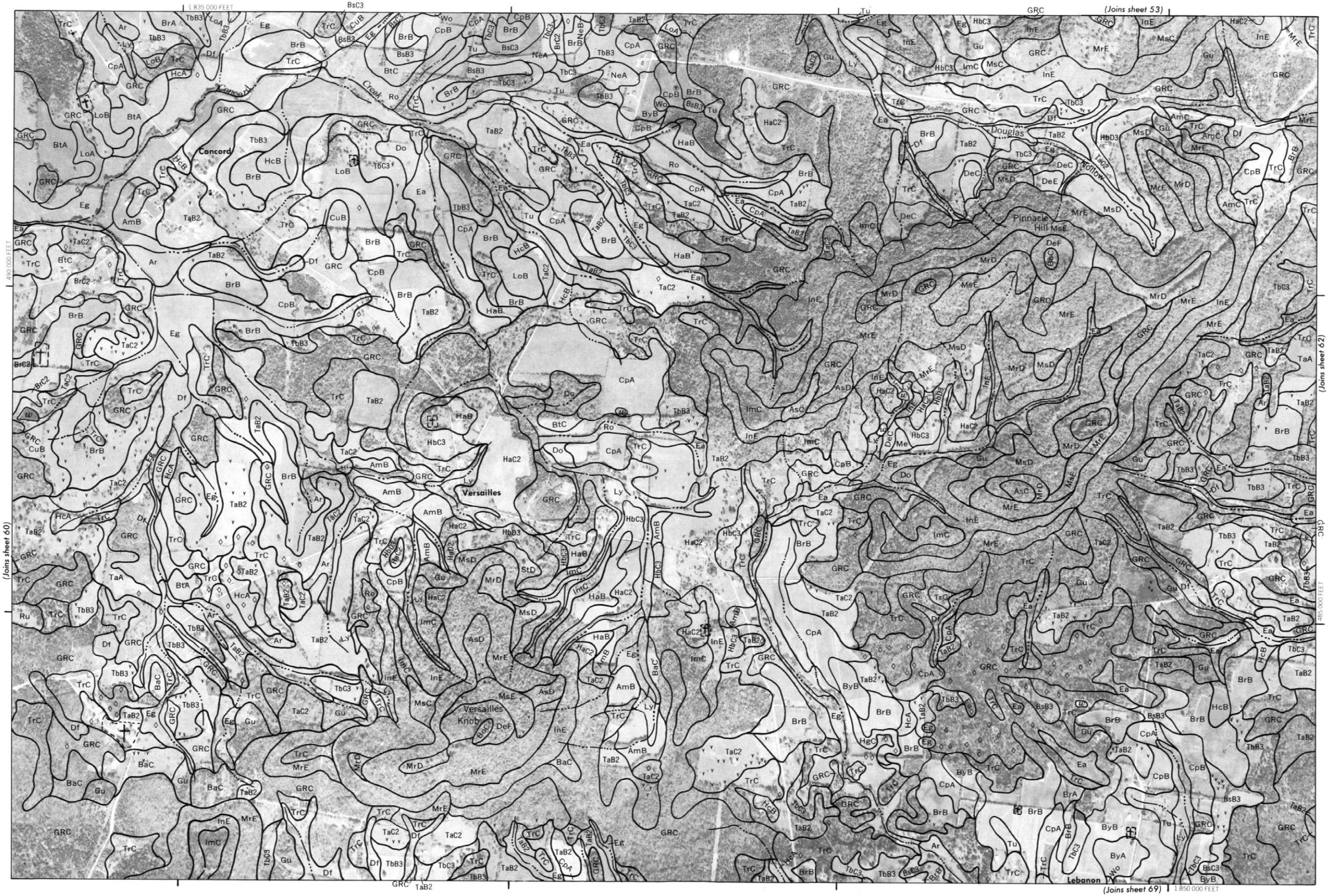
Concord Creek

Kelley Creek

Puckett Branch

Bell Ray Hill

Hudson Hill


1 835 000 FEET
490 000 FEET
485 000 FEET
1 850 000 FEET
(Joins sheet 53)
(Joins sheet 60)
(Joins sheet 62)
(Joins sheet 69)
Concord
Versailles
Versailles Knob
Pinnacle Hill
Douglas
Lebanon
Concord Creek
Hollow
61
N
1 Mile
5 000 Feet
Scale 1:15 840
0
¼
½
¾
1
1 000
2 000
3 000
4 000
5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 62

62

N

Scale 1:15 840

1 Mile

5 000 Feet

(Joins sheet 54)

(Joins sheet 61)

(Joins sheet 63)

(Joins sheet 70)

70 000 FEET

490 000 FEET

485 000 FEET

1 855 000 FEET

Creek

Panther

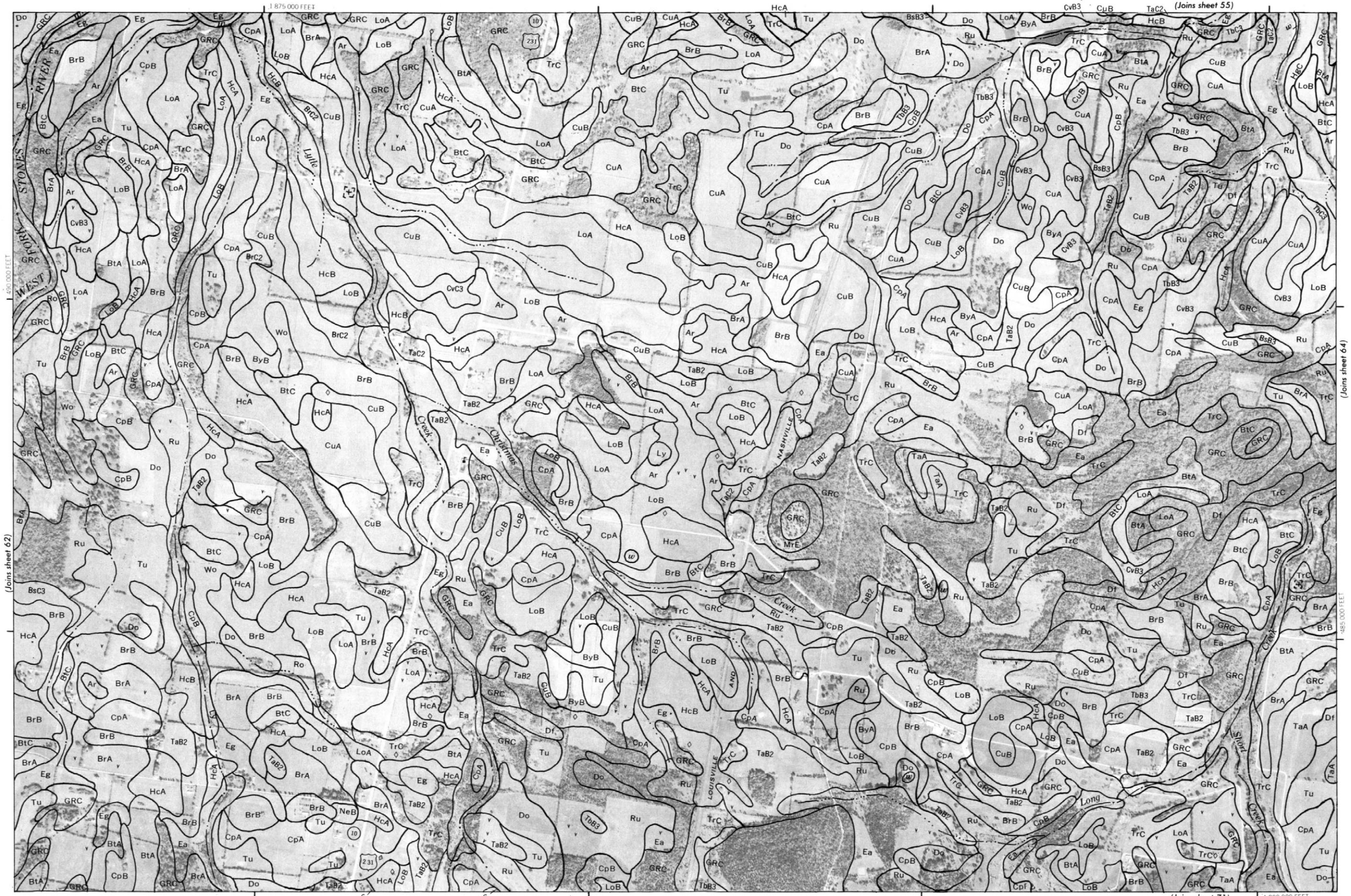
STONES

RIVER

FORK

WEST

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 63



RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 64

64

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 56)

(Joins sheet 63)

(Joins sheet 65)

(Joins sheet 72)

1 910 000 FEET

1 895 000 FEET

490 000 FEET

485 000 FEET

Middle Fork Buzzard Branch

Stones River

Hurricane Creek

Long Creek

65

N

1 915 000 FEET

430 000 FEET

485 000 FEET

(Joins sheet 57)

(Joins sheet 66)

(Joins sheet 64)

(Joins sheet 73)

Lytle Creek

Hurricane Creek

Dry Creek

Long Ridge

Taylor Hollow

Todd Hollow

1 Mile

5 000 Feet

Scale 1:15 840

0 0

1/4 1 000

1/2 2 000

3/4 3 000

1 4 000

5 000

66

N

(Joins sheet 58)

1 945 000 FEET

Scale 1:15 840

1 Mile 5 000 Feet

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

485 000 FEET

490 000 FEET

(Joins sheet 65)

(Joins sheet 74)

1 930 000 FEET

CRIPPLE CREEK

Donnell Chapel

Jacob Hollow

Armstrong Hollow

Burk Hollow

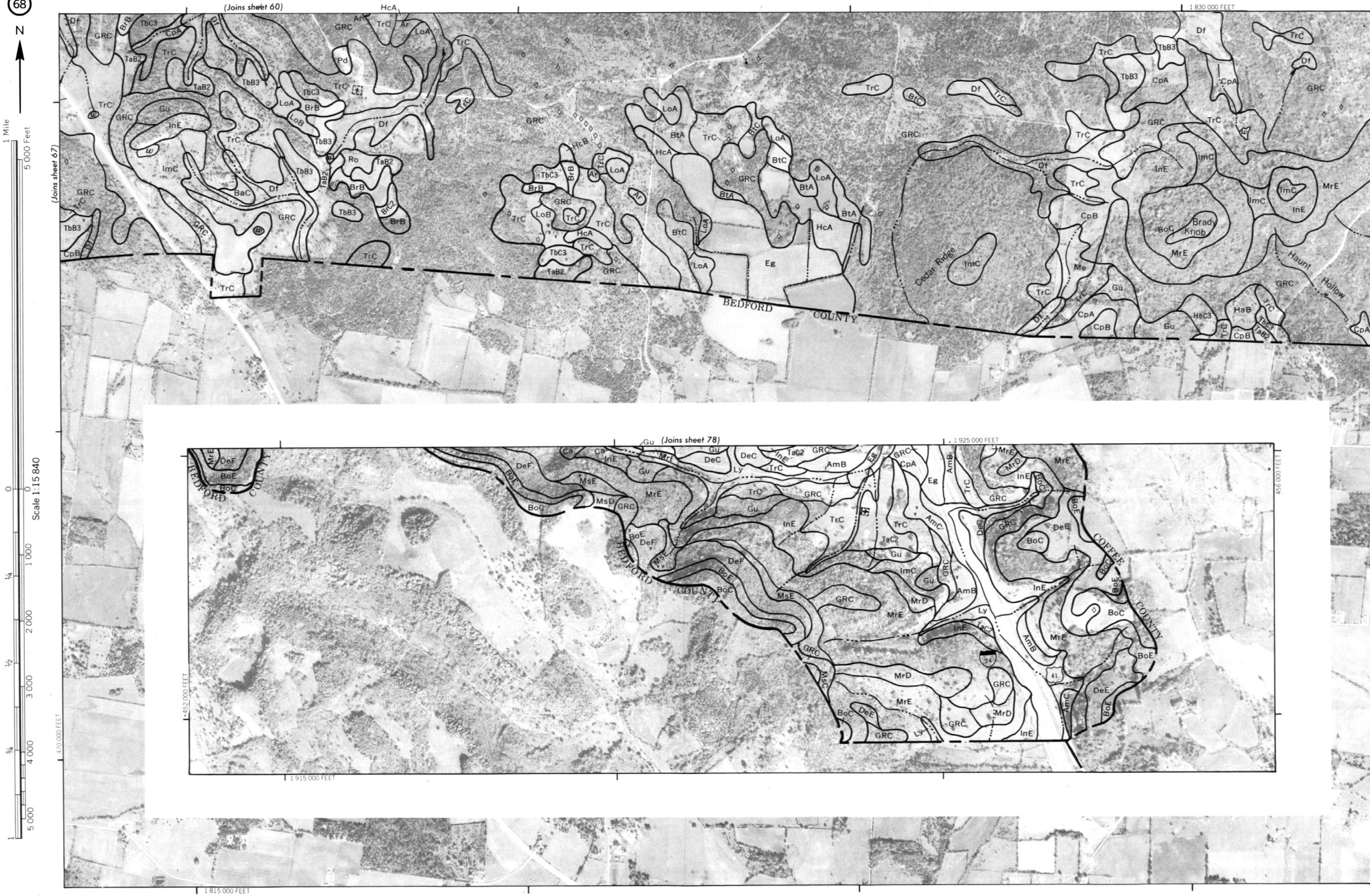
Reed

COUNTY

CANNON

Prater Hill


1 795 000 FEET
480 000 FEET
WILLIAMSON COUNTY
MARSHALL COUNTY
BEDFORD COUNTY
East Fork Spring Creek
(Joins sheet 59)
(Joins sheet 68)
(Joins sheet 69)
(Joins sheet 75)
1 849 000 FEET
468 000 FEET
463 000 FEET
1 852 000 FEET
3000 AND 5000-FOOT GRID TICKS
1 810 000 FEET
470 000 FEET
67
N
1 Mile
5 000 Feet
Scale 1:15 840
0
¼
½
¾
1
1 000
2 000
3 000
4 000
5 000


N
(Joins sheet 60)
(Joins sheet 67)
(Joins sheet 69)
(Joins sheet 78)
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾
1
1 830 000 FEET
480 000 FEET
1 925 000 FEET
456 000 FEET
452 000 FEET
470 000 FEET
1 915 000 FEET
1 815 000 FEET
BEDFORD COUNTY
COFFEE COUNTY
Cedar Ridge
Brady Knob
Haunt Hollow
24
41

N

1 835 000 FEET

480 000 FEET

(Joins sheet 61)

(Joins sheet 68)

(Joins sheet 70)

Dripping Spring

Lamb Bottoms

BEDFORD COUNTY

(Joins sheet 75)

1 865 000 FEET

1 870 000 FEET

455 000 FEET

454 000 FEET

1000 AND 5000-FOOT GRID TICKS

1 850 000 FEET

CpA (Joins inset, sheet 67)

1 Mile

5 000 Feet

Scale 1:15 840

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 70

70

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 62)

(Joins sheet 69)

(Joins sheet 75)

(Joins sheet 71)

1 870 000 FEET

480 000 FEET

470 000 FEET

1 855 000 FEET

STONES RIVER

WEST FORK

Johns Spring

Holden Spring

Paulins Creek

71

N

1 876 000 FEET

1 890 000 FEET

470 000 FEET

460 000 FEET

(Joins sheet 63)

(Joins sheet 70)

(Joins sheet 72)

(Joins sheet 76)

Christiana

NASHVILLE

Short Creek

Henry Creek

Christmas Creek

Louisville AND

water

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

RUTHERFORD COUNTY, TENNESSEE — SHEET NUMBER 72

72

N

(Joins sheet 64)

TbB3

1 910 000 FEET

460 000 FEET

(Joins sheet 71)

(Joins sheet 73)

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

470 000 FEET

(Joins sheet 77)

1 895 000 FEET

TaB2

TbB3

N

1 915 000 FEET

480 000 FEET

(Joins sheet 65)

(Joins sheet 72)

(Joins sheet 74)

(Joins sheet 78)

1 930 000 FEET

470 000 FEET

Scale 1:15 840

1 Mile

5 000 Feet

Big Springs Creek

Middle Fork Stones River

Pilot Knob

Kelton Hollow

Fox Hollow

Morgan Ridge

COUNTY

COFFEE

74

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 66)

(Joins sheet 73)

1 945 000 FEET

1 930 000 FEET

470 000 FEET

COFFEE COUNTY

CANNON COUNTY

INSET A

(Joins sheet 29)

(Joins sheet 36)

1 954 000 FEET

1 950 000 FEET

540 000 FEET

535 000 FEET

480 000 FEET

4000 AND 5000-FOOT GRID TICKS

McKnight Branch

CANNON COUNTY

INSET B

1 940 000 FEET

1 930 000 FEET

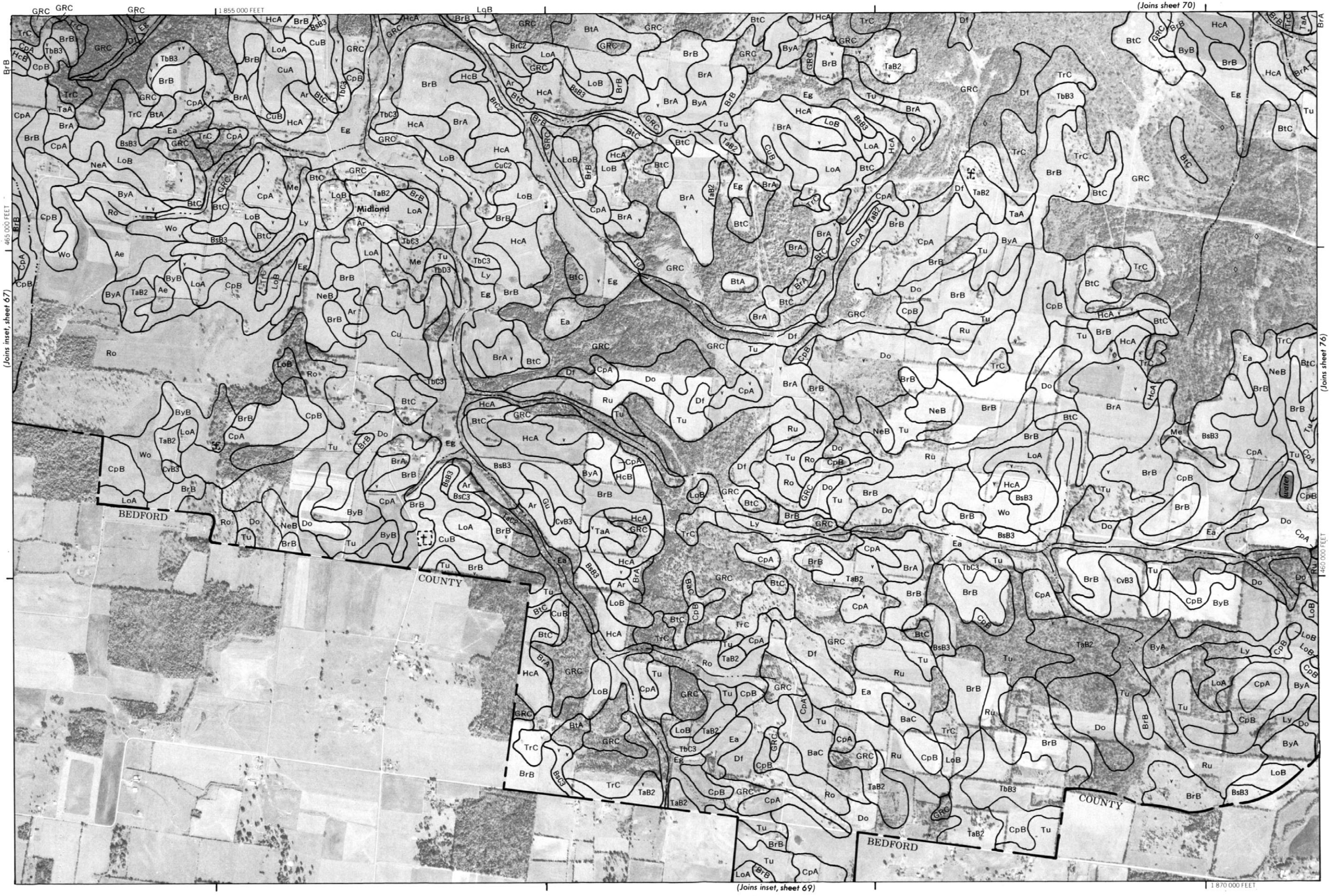
572 000 FEET

574 000 FEET

(Joins sheet 21)

2000 AND 5000-FOOT GRID TICKS

WILSON COUNTY


1 855 000 FEET
(Joins sheet 70)
465 000 FEET
(Joins inset, sheet 67)
(Joins sheet 76)
Midland
BEDFORD
COUNTY
BEDFORD
COUNTY
(Joins inset, sheet 69)
1 870 000 FEET
75
N
1 Mile
5 000 Feet
Scale 1:15 840
0
1/4
1/2
3/4
1
1 000
2 000
3 000
4 000
5 000

(76)

N

1 Mile

5 000 Feet

Scale 1:15 840

1 890 000 FEET

465 000 FEET

460 000 FEET

1 875 000 FEET

(Joins sheet 71)

(Joins sheet 75)

(Joins sheet 77)

(Joins sheet 79)

Nebo Knobs

Fork

Creek

LOUISVILLE AND NASHVILLE

Fosterville

Hickory Hill

Soapstone Hill

BEDFORD COUNTY

BEDFORD COUNTY


1 895 000 FEET
465 000 FEET
460 000 FEET
1 910 000 FEET
(Joins sheet 72)
(Joins sheet 78)
(Joins sheet 75)
COUNTY
BEDFORD
COUNTY
BEDFORD
Short Creek
77
N
1 Mile
5 000 Feet
0
Scale 1:15 840
1/4
1/2
3/4
1
1 000
2 000
3 000
4 000
5 000

78

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

(Joins sheet 73)

(Joins sheet 77)

(Joins inset sheet 68)

1 925 000 FEET

1 915 000 FEET

465 000 FEET

460 000 FEET

Middle Fork

Fox Hollow

Broyles Hollow

Broyles Cave

Hoovers Gap

Locust Knob

Dismal Hollow

Mason Hollow

Teal Ridge

Eaton Hollow

Stones River

COUNTY

BEDFORD COUNTY

COFFEE COUNTY

(Joins sheet 76)

1 875 000 FEET

455 000 FEET

445 000 FEET

1 890 000 FEET

COUNTY

BEDFORD

Dry Fork

Creek

LOUISVILLE

NASHVILLE

AND

Ca

79

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000